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PC ADVISOR

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DESKTOP CHAMPS



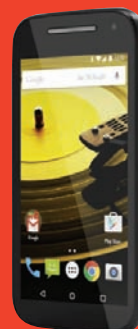
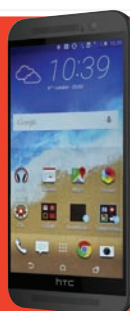
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PC REVIEWS
INSIDE

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- Galaxy Note Edge
- Motorola Moto E 4G



ISSUE 239 JUNE 2015

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JIM
MARTIN



Windows on a phone

Windows Phone is a real alternative to Android and iOS

Welcome to *PC Advisor*. It's smartphone season, and we've reviewed no fewer than 11 of the latest phones ranging from the ultra-affordable £49 Lumia 435 (page 36) up to the wallet-busting HTC One M9 (page 34) flagship, as well as everything in between.

Despite its relatively slow uptake, we're still fans of Windows Phone, which the Lumia 435 runs. Thanks to updates, it's now a real alternative to Android and iOS. Microsoft is also promising that a good proportion of Lumias will be upgradeable to Windows 10, which should be available later this year.

We've been running an early build of Windows 10 on a Lumia 830 and you can find out all about the new features on page 86. If you have a compatible phone, you can try the Technical Preview as well by following our online guide at tinyurl.com/oby648w.

And if you haven't given the desktop version of Windows 10 a try yet, it's well worth doing so. It's remarkably stable, and there are quite a few new features to play with. Some are hidden, and our guide on page 82 explains how to enable them.

Increasingly we're seeing interest in buying phones and gadgets from China thanks to temptingly cheap prices compared to the equivalent in the UK. There are certainly bargains to be had - just take a look at the phones on page 42 to 44 - but also pitfalls to watch out for. We've put together a comprehensive guide on the grey market on page 96.

Another reason to buy a phone from outside of the UK is to get one with two SIM slots. Dual-SIM phones aren't that common here, but most Chinese phones have two slots. However, you'll need to be clued up to avoid buying a phone that won't do what you want it to, so make sure you read our expert's guide on page 100.

Plenty of people rushed out to buy an Xbox One or PS4 when they launched last year, but while both are great games consoles, they still can't compete with a top-spec PC for graphics quality. In our PC group test on page 56 you'll find supremely powerful desktops that will easily cope with any game, as well as being easy to upgrade in the future.

And if you think there's no room left for innovation when it comes to PCs, HP would like you to think again. Its oddly named Sprout (page 93) is capable of some fantastic things and while it's not for everyone, it's proof - if any were needed - that the PC isn't going away just yet.

If you've ever wanted to use the internet in true privacy, or without restrictions being placed on sites you can access because of your location, you need a VPN service. Starting on page 72, we explain everything you need to know about them and why it's worth paying for one over the multitude of free services out there.

ISSUE 240 ON SALE 20 MAY 2015

NEWS & ANALYSIS

- 10 AI after your job
- 11 Unintuitive iPads
- 12 Badges of honour
- 13 You look familiar
- 14 Transforming gadgets
- 18 HTC's tough sell
- 19 Smartphone components
- 20 Microsoft supports 8K video
- 21 Acer's powerful Chromebook
- 21 Google's London store
- 22 Speeding up LTE
- 23 USB Type-C is here

REGULARS & OFFERS

- 3 Welcome
- 24 New Products
- 113 Cover Disc+



- 116 Subscribe
- 146 Outbox

Subscribe to PC Advisor and
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FEATURES & GROUP TESTS

56



- 56 Gaming PCs
- 64 Drones
- 72 Best VPN services
- 82 Windows 10
- 86 Windows 10 for phone
- 90 Office on Android
- 93 HP Sprout
- 96 Grey market tech
- 100 Dual-SIM buying advice

REVIEWS

TEST
CENTRE

- 30 Asus ZenBook UX305F
- 31 Acer Chromebook 13
- 32 Toshiba Satellite Radius 11
- 33 Acer Iconia Tab 10
- 34 HTC One M9
- 35 Samsung Galaxy Note Edge
- 36 Microsoft Lumia 435
- 37 Motorola Moto E
- 38 Huawei Ascend G7
- 39 Honor Holly
- 40 HTC Desire 620
- 41 ZTE Blade S6
- 42 Elephone P5000
- 43 Doogee F1 Turbo Mini
- 44 Prestigio Multiphone 5550 Duo
- 45 Nokia 105
- 46 Zota GeForce GTX 960 Amp! Edition
- 47 SMS Audio BioSport
- 48 Jabra Sport Plus Wireless
- 49 iClever IC-BTS02
- 49 Inateck BTSP-10
- 50 Aukey PB-N30 3600mAh
- 50 Aukey PB-C1 2-in-1 External Battery and Cigarette Lighter
- 51 Anker Astro E5 15000mAh
- 51 BrydgeAir for iPad Air/Air 2
- 52 Olixar 6 USB Smart IC Charger
- 52 Zendure 5-Port Turbo Desktop Charger
- 53 MAGIX FastCut
- 54 HP Z1 G2
- 55 Canon i-Sensys LBP6230dw

MID-PRICE GAMING PCS

- 58 Chillblast Fusion Mantis
- 58 Cyberpower Infinity Achilles Pro GT
- 59 Dino PC Spark GTX 960
- 59 Eclipse SuperNova i5r285oc
- 60 Scan 3XS Gamer
- 61 Vibox Wildfire

DRONES

- 66 DJI Phantom 2 Vision+ V3.0
- 67 Hubsan FPV X4
- 68 Lishitoys L6039
- 69 Parrot AR.Drone 2.0 Elite Edition
- 70 Revell X-Spy
- 71 WLToys V666

VPN SERVICES

- 74 AirVPN
- 75 CyberGhost VPN
- 76 Hide My Ass! Pro VPN
- 77 IPVanish
- 78 NordVPN
- 79 Private Tunnel

34

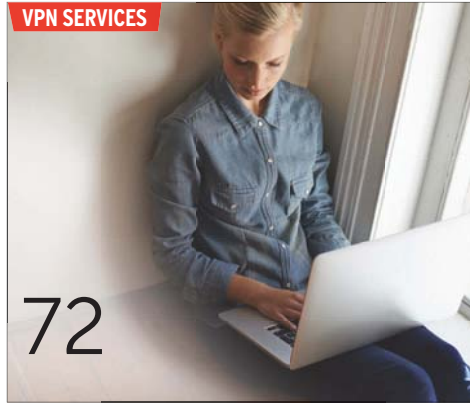


DRONES



64

VPN SERVICES



72

WINDOWS 10 FOR PHONE



86

OFFICE ON ANDROID



90

ON THE COVER

56



35

86

64

TEST CENTRE

TOP 5 CHARTS: BUYER'S GUIDE

- 119 Laptops
- 120 Budget laptops
- 121 Ultraportable laptops
- 122 Chromebooks
- 123 Gaming laptops
- 124 Family PCs
- 127 Gaming PCs
- 128 All-in-one PCs
- 129 Smartphones
- 130 Budget smartphones
- 131 Phablets
- 132 7- and 8in tablets
- 133 9- and 10in tablets
- 134 Smartwatches
- 135 Activity trackers
- 136 Budget printers/Printers
- 137 Wireless routers/Powerline adaptors
- 138 NAS drives/External hard drives
- 139 SSDs/Projectors
- 140 Budget graphics cards/Graphics cards
- 141 Budget flat-panel displays/Flat-panel displays
- 142 e-book readers/Media streamers
- 143 Games console/Budget portable speakers
- 144 Budget headphones/Headphones
- 145 Power banks/Desktop chargers

HOW TO

Tech Help

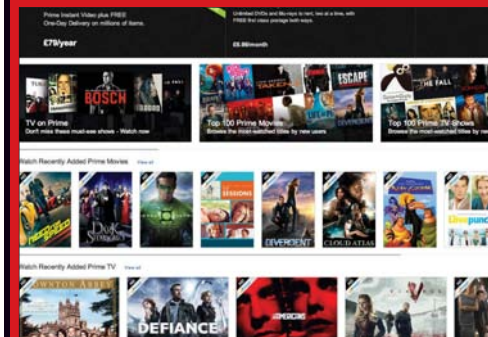
104 Rid your router of malware



105 Multiple work spaces in Linux

106 Disable TouchWiz

108 Get Amazon Prime for just £16 per year



109 Set up video-entry system

110 Link Facebook and Android contacts

111 Fix WhatsApp

112 Wirelessly charge a phone



Intel announces next generation of budget mobile processors

Intel now offers a range of chips that covers cheap mobiles, to wearables and laptops

At MWC 2015 Intel announced its Atom x3, x5 and an x7 range of components. These low- and mid-priced mobile processors with built-in connectivity are Intel's assault on mass-market mobile devices, offering power and connectivity to everything from basic, ultra-low-cost smartphones and feature phones, up to high-end smartphones, phablets and tablets, IoT devices, and wearables.

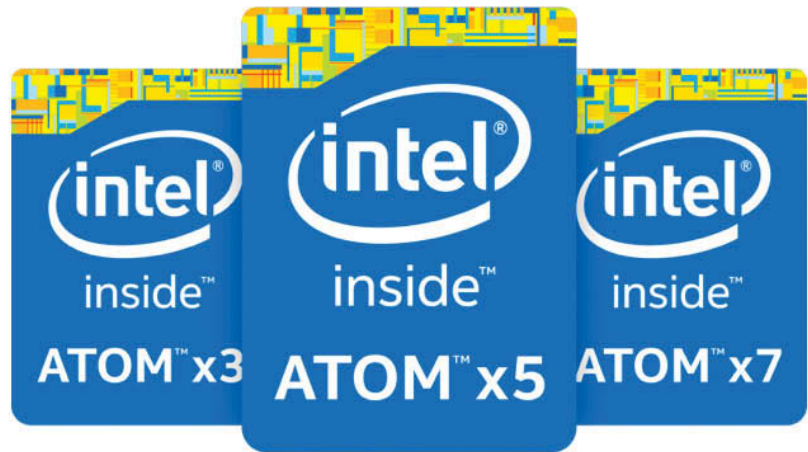
The Intel Atom processors are coming this year, and are designed to work with "full" Windows 10 and Android, Intel said.

Speaking about the addition of this range to its existing high-end Intel Core M processors, Intel told *PC Advisor* that it now has hardware for everything from the smallest and cheapest devices, up to network infrastructure: "It's an end-to-end play... not all companies can play in this space in such a fundamental way."

Core M chips are designed for laptops, hybrids and 2-in-1 convertible devices. The new Atom processors are SoCs, offering both CPU and modem for smartphones and tablets. Intel said that "these devices are competitive, in terms of power consumption... with integrated modem [making them] on par or better in terms of battery life" with other devices on the market. This remains to be seen, of course, and Intel has traditionally found it hard to compete with ARM devices in terms of battery life. But it would make sense that devices with integrated power- and connectivity hardware would enjoy generally better battery life.

Intel said about the range announcement: "Consumers have choices to make around price, device type, screen quality, battery life." The launch of Intel Atom x3, x5 and x7 is, the company said, a "comprehensive, foundational way of coming into this market, taking share, and having the full stack of customisable solutions for our customers."

What should be good for customers is that if Intel comes to play in the mobile market, it's able to buy its way in with excellent products at friendly prices for OEMs. And that should mean better, cheaper smartphones, tablets and laptops for consumers.



Intel Atom x3

This is the chip maker's first integrated communications system on chip, designed for smartphones, phablets and tablets at low-cost and mid-range price points. Intel Atom x3 offers processing power, and 3G and LTE connectivity.

Intel says the Atom x3 chips offer 64-bit-enabled performance without damaging battery life. The chips scale from 3G up to 4G LTE, and are certified to work with Windows and Android. Intel claims that the Atom x3 will look after graphical and image-capture performance. Wi-Fi, Bluetooth and NFC are baked in, as well as FM radio.

The Intel Atom x3 products are shipping now with 3G, with 3G-R products coming later in this quarter, and LTE later this year. And Intel said that the low-end Atom x3 products could be found in \$75 (£50) budget devices.

Intel listed multiple manufacturers who were committed to using Intel Atom x3 processors, it said. To our western consumer eyes they were largely unknown names, with the exception of Asus and Foxconn. Intel acknowledged that it will face a challenge

to oust the Qualcomm and Mediatek ARM processors found in smartphones at this price. Which should ultimately be good news for consumers.

Intel Atom x5 and x7

Scaling further up the range are the Intel Atom x5 and x7 families of processors. These are for products that, Intel says, offer 'full' Windows- and Android experiences. Aimed at mainstream-to-premium devices ranging in price from \$119 to \$499 (£80 to £340), the Intel Atom x5 and Intel Atom x7 products are designed for 7in tablets up to 10.1in two-in-ones, convertible laptop/tablet devices.

Intel's first Atom-branded SoC manufactured on the 14nm process, Intel says the Atom x5 and x7 offer 64-bit CPUs and Intel Gen 8 graphics. This should offer a 'full' Windows and Android OS experience on more expensive portable devices, albeit still not at the premium range in which Intel Core M chips come into play.

Intel said that Asus, Acer, Dell, HP, Lenovo, and Toshiba were all committed to producing Intel Atom x5 and Intel Atom x7 products in the first half of this year.

What should be good for customers is that if Intel comes to play in the mobile market, it's able to buy its way in with excellent products at friendly prices for OEMs

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Microsoft to introduce biometric authentication

CHRIS
MARTIN



Windows 10 to support password-killing Fast Identity Online 2.0 specification

Microsoft is about to officially join the fight for authentication without pesky passwords. It recently announced that Windows 10 will support the Fast Identity Online (FIDO) 2.0 specification. The end result is that instead of using passwords to log in to PCs, Microsoft services, and other third-party accounts, you'll also be able to use a fingerprint or eye scan - possibly integrated with a key fob for two-factor authentication.

In its blog post announcing FIDO in Windows 10, Microsoft focused largely on features that would interest IT types, such as FIDO support for major enterprise-focused cloud services including Office 365 Exchange Online, Salesforce, Citrix and Box. But FIDO in Windows 10 will also work with consumer services such as Windows 10 sign-ins, Outlook.com, and OneDrive.

The call to kill passwords with a better authentication solution has been going

on for some time. FIDO appears to be the best chance for a one-size fits all solution to password-less authentication. The FIDO Alliance includes many major tech companies and other businesses with a big interest in security, including Google, MasterCard, PayPal, and Visa. Microsoft joined the FIDO Alliance in late 2013. When heavy hitters work together on problems like this the end result tends to be a near-universal solution.

The idea behind FIDO isn't new. Instead of using passwords - that can be forgotten, lost, stolen or even guessed - a FIDO-equipped device would use biometrics such as fingerprint and eye scans that are much harder to acquire. This initial login method could also be paired with a key fob for two-factor authentication for added security.

Biometric scanners have already been integrated into smartphones, laptops, and other devices for years. The difference with



FIDO is that it's an open standard, meaning any company can implement it into their products or services. FIDO's specifications are designed so a user's biometric data doesn't leave the device.

For anyone that wants to check it out, Microsoft says FIDO integration is already available in the Windows 10 Technical Preview for enterprise applications, as well as Windows 10 sign-in.

Cortana may come to iOS and Android

Microsoft will continue its cross-platform push by bringing Cortana to Android and iOS devices

Cortana, Microsoft's Xbox-themed digital assistant, is reportedly coming to Android and iOS as a standalone app. A new Reuters report says it will come to Microsoft's rival mobile platforms after the digital assistant's debut on Windows 10 later in 2015.

This isn't the first time we've heard of Cortana working on non-Windows devices. In November 2014, Microsoft chief experience officer Julie Larson-Green said during a meeting with reporters that Cortana could come to other platforms.

Extending the digital assistant's reach beyond Microsoft's mobile platform, therefore, is key to making Cortana useful to Windows users. To be effective, any digital assistant requires access to all kinds of

information, including important data pulled from phones such as location history and web searches. Since most mobile devices users are definitely not using Windows Phone - especially in the US - it makes sense that Microsoft is looking to bring Cortana to where its users are.

Bringing a marquee Windows feature to other platforms also emphasises, the shifting priorities for Microsoft as it looks to become a truly cross-platform software provider.

Reuters also says Microsoft is planning some improvements to Cortana for the fall, pulled from a company artificial intelligence research project called Einstein.

It's not clear what kind of improvements Microsoft is planning, but from the Reuters

interview with Eric Horvitz, managing director of Microsoft Research and part of the Einstein project, it sounds like the focus is on better understanding of context within email. Cortana already parses email to surface reminders for, say, an upcoming flight. If the Cortana improvements work out as Microsoft is hoping, however, the digital assistant could become better at predicting a user's needs, similar to Google Now.

If Microsoft's digital assistant does come to Android and iOS, it won't be the first time we've seen a digital assistant ship as its own app. Apple's Siri began life as a third-party iOS app that was later acquired by the company, and Google currently offers a stripped down version of Google Now on iOS.



All 4 launches to replace Channel 4's 4oD

Channel 4 has rebranded its popular 4oD catch-up and on-demand service. It's now called 'All 4'. The new digital home for all Channel 4 content will 'present all of Channel 4's channels, digital content and services in one place, for the first time'.

All 4 offers content from the past, present and future - On Demand, Now and On Soon respectively. The most interesting is On Soon, which will showcase new clips and promos of upcoming shows. Registered viewers will get an increasingly personalised experience with a bespoke set of content and related experiences for viewers.

MORE: tinyurl.com/os52ts2



Deezer Elite launched in UK

As one of the biggest rivals to Spotify, Deezer has introduced a new service to its music streaming business. Deezer Elite is a new subscription service that will offer users high definition music.

You can try it out with a one-month free trial, but after that it will cost you £14.99 per month. However, if you sign up for a year it will cost you the equivalent of £10 per month, with a one-off payment of £120.

If you subscribe to Deezer Premium+, you'll be able to upgrade for no extra cost provided you sign up for a year.

MORE: tinyurl.com/qbfr36u

Office preloaded on Android devices

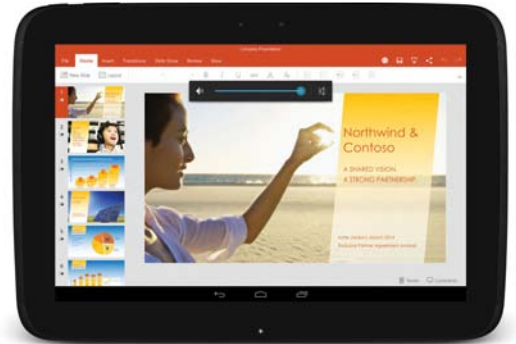
Microsoft eager to extend its services beyond Windows

If it can't sell customers on Windows, Microsoft's Plan B has been to bring its services to other platforms. In March, it did just that, porting Office to Android tablets made by Samsung, Dell, and others.

For Samsung, the Office deal represents an expanded partnership with Microsoft. At Mobile World Congress, Samsung announced that it would pre-install OneNote, OneDrive and Skype to its Galaxy S6 and Galaxy S6 Edge phones. Samsung also pre-announced the Office partnership with Microsoft, as an executive claimed it would be marketed as part of its KNOX security solution for phones and tablets.

That's partially true. Microsoft Word, Excel, PowerPoint, OneNote, OneDrive and Skype will be pre-installed on select Android tablets, both companies said Monday. Businesses that purchase devices through Samsung's business-to-business sales channels will have access to three versions of Office 365 - Business, Business Premium and Enterprise - coupled with Samsung's KNOX security solution, Microsoft said. The bundle also includes a setup and support service from Samsung.

Most people will see Microsoft's Office suite as a useful addition to an Android tablet. A one-year



trial of Office 365 materially contributes to the value of the device. The flip side, however, is that Android users, long used to living without Office, may see its sudden appearance as bloatware, even if they can uninstall it.

But while Samsung was the biggest name to sign up for Microsoft's Office 365, it was not the only one. Microsoft signed similar deals with 11 other hardware partners, including Dell in the United States, to port the Office apps to other Android platforms.

All will pre-install Word, Excel, PowerPoint, OneNote, OneDrive and Skype on Android devices coming to market later this year, Microsoft said.

BT returns to mobile market with 4G deals

Communications giant is back to the mobile market with a massive bang

Having acquired EE for £12.5bn, communications giant BT is returning to the mobile market, offering unrivalled 4G SIM-only plans for BT Broadband customers from just £5 per month.

All BT's mobile plans come with free access to BT Sport, which holds the viewing rights to exclusive Barclays Premier League football matches, plus unlimited access to BT Wi-Fi hotspots. On a 12-month SIM-only plan from BT you can also make use of parental controls, and switch freely between plans during your contract.

There are three tariffs to choose from, with the cheapest just £5 a month for BT Broadband customers (£10 for everyone else). This deal nets you 500MB of 4G data, unlimited texts and 200 minutes. A second plan is suited to more regular internet users, with BT charging £12 a month (£17 for everyone else) for 2GB of 4G data, unlimited texts and 500 minutes. Finally, heavy internet users can grab a massive 20GB of 4G data, unlimited texts and unlimited minutes for £20 per month (£25 for everyone else).



By comparison, Vodafone is offering a special deal on the same tariff (Red XXL), but even while it's reduced by £10 it's still £10 more expensive than BT's 20GB plan at £30 per month.

All BT's plans are SIM-only and for 12 months. You can use your existing (unlocked) phone, or pick up a 4G phone from the BT Shop from £99. BT Mobile customers can also benefit from a £50 discount. Any person living within a BT Broadband household can take advantage of the deal, and a customer can have up to five plans on one bill to cover the entire family.



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NEIL BENNETT



AI could be after your job

The real danger of AI isn't killer robots, but that one might steal your job

During a recent visit to San Jose, there was much discussion on the latest approaches to artificial intelligence. Elon Musk, founder of cutting-edge electric car maker Tesla, attempted to walk back his widely reported comments that AI was the "biggest existential threat" to the human race, while Andrew Ng from Baidu (the 'Chinese Google') proposed that the biggest threat from AI was to jobs and the economy.

Both were keynote speakers at nVidia's GPU Technology Conference, where there has been a focus on deep learning, where neural networks loosely based on the human brain learn to do specific things by themselves. This approach is used to create computer systems that can drive autonomous cars or recognise things in photos so image-based searches aren't reliant on image metadata. Systems like these are apparently best developed on graphics chips rather than computer chips, hence nVidia's interest.

Asked by nVidia CEO Jen-Hsun Hsang if he still believed that AI was more

dangerous than nuclear weapons, Musk says that this was just a remote possibility in the far future. The kind of AI that firms such as Tesla are developing to create cars that can drive themselves is so limited that it's hard to see how you'd get from that to sentient Terminator robots and Skynet.

According to Musk, we're still a long way from a truly autonomous car and the first forms of automated driving will come in baby steps, as AI-enhanced forms of cruise control and parking assistance.

This didn't stop Musk throwing out another of his infamous provocative comments, saying that when truly autonomous cars arrive, governments could ban people from driving themselves. "It's too dangerous," he said. "You can't have a person driving a two-ton death machine."

The robots are coming

A more realistic danger, according to the chief scientist at Baidu Research, the California-based R&D arm of the Chinese search engine. Andrew Ng has a long history in artificial intelligence, founding

the Google Brain project in 2011 and he's also a professor at Stanford University, so his predictions are likely to be more grounded than Musk's.

Ng describes talk of killer robots as an "unnecessary distraction", saying instead that "the challenge to labour by artificial intelligence is a real issue we should discuss."

By this, he's referring to the idea that artificial intelligence could have a similar impact on service jobs that robots and similar machinery had on manufacturing jobs and digital service design had on retail jobs. From taxi drivers to call centre staff, autonomous driving and complex speech recognition could replace real people with large-scale computer systems.

As with robots replacing workers on car production lines or online banking leading to a lot fewer counter staff in banks, I'm not sure unions or government can prevent or even delay this progress. However, Ng's right that it's something we need to be aware of and make accommodations for in society. Especially if these AI's learn to write journalism. ☒

iPads aren't an intuitive device

Why the elderly can have trouble getting to grips with an iPad

Not so long ago, I wrote a guide to setting up a new iPad, aimed at anyone opening a new Apple tablet. At the time I considered it pretty comprehensive, taking as it did the user from turning on the device for the first time, through connecting to Wi-Fi, setting up an Apple ID and eventually to the home screen.

However, as I discovered recently, this is far from the end of the process. I'd agreed to help an elderly lady set up her first iPad – an original iPad mini – so she could get rid of her Windows XP PC and jump straight into the 21st century. Knowing that she would only want to use Safari, Gmail and YouTube I figured it should take less than an hour. I couldn't have been more wrong.

It turned out that someone had attempted to set it up for her, misspelling her email address for the Apple ID and choosing US English instead of UK. Easy to fix, or at least it should have been. I tapped the option for a forgotten password and was redirected to Safari to Apple's iForgot site.

After entering the correct email address, the system naturally reported there was no such account and gave me the option to create a new Apple ID. However, having filled out the entire form and pressing the button to create the account, Safari threw up an error saying it "couldn't download the file". Apparently then, you can't use Safari on an iPad to create an Apple ID.

At this point I decided to factory reset the iPad and start from scratch, allowing me to choose the appropriate options for language, location services, diagnostic reporting, and so on. At last we were at the home screen – the end of my tutorial – but the work was only really just beginning.

What I'd forgotten was that setting up "as a new iPad" means it's effectively a blank canvas. No backups are restored, no apps are installed, and no payment or address is set up for the App store.

Worse still, on opening the Mail app, which I'd configured for Gmail during the initial setup process, a message appeared saying the password was incorrect. It had been changed, but the lady had no idea what it was – it logged her in automatically each time on the XP PC for some reason. Fortunately, it's possible to choose which email address to which you send the password recovery instructions, so I used my own, verifying it with a code sent to my iPhone.

Email's sorted I thought, but no. With the new password entered on the iPad, a new error flashed up. This time, Gmail wasn't



configured for IMAP, which meant using the XP PC to delve into Gmail's murky settings page to disable POP and enable IMAP.

Next up was the App store. The first time you try to purchase an app, you have to enter your Apple ID password and then fill out the payment and address form. Fortunately Apple has updated this with a 'None' payment option that lets you download free apps. Then it was a case of opening each app in turn to make sure they would work.

By now almost two hours had passed, partly due to the repeated interruptions of small talk and the more welcome break for tea and chocolate éclairs, but the job was far from finished. Being her first tablet, it was necessary to explain how to use a touchscreen and – indeed – how iOS works.

Simple things we all take for granted, such as switching between letters and numbers on the iOS keyboard are alien to a first-time user. As is the fact a capacitive screen doesn't respond to pressure. Watching this lady trying to launch an app was an eye-opener: she first slid her finger over the YouTube icon, then tried pressing harder – neither of which techniques worked. On the third attempt after some instruction, a quick stab did the trick.

I then realised that not all apps make it obvious how to navigate around. In Mail, the list of emails appears and disappears when you change focus to the email itself, and in Safari, it's far from obvious that you have to drag down to show the search and address bar. Again, things I take for granted, but which have to be explained to someone coming from a desktop PC.

Before leaving, my friend asked if I could make the text larger so everything was easier to read. Another easy fix, I thought. Apple has built many accessibility options into iOS, but until you actually use some of them you don't realise how useless they are.

It's simple to increase the font size, but it doesn't apply globally. Text is larger in emails, but not below app icons, nor in menus. It remains tiny and difficult to read for anyone with poor eyesight.

Accepting these limitations, I decided to make the final lesson an idiot's guide to the keyboard so she could enter her password when it was needed. Apple passwords require at least one capital letter. Problem is, how do you know if your Shift key is pressed? Sometimes it is in order to automatically capitalise the first letter of a word, and you can't guarantee a password field won't use this feature. When you tap the Shift key, it changes from the default of a grey key with a white arrow to white with a black arrow. But since the alphabetic keys don't change from upper- to lower-case it's trial and error to work out which state is which.

Having spent almost two-and-a-half hours, I'd barely made it possible for this lady to send an email, watch a YouTube video and visit a website. It'll be fascinating to see whether she adapts to the iPad or finds it impossible to make the switch from a desktop PC to a small touchscreen tablet. ☒

JIM MARTIN





Badges of honour

How Google won MWC 2015 with tiny Android pins

Back in March, MWC 2015 took place in Barcelona and this is the story of how Google stole the show with a simple but extremely effective PR stunt.

As we do every year, we packed our bags and set off for sunny (warmer than the UK) Spain to check out all the new smartphones, tablets, wearables and other gadgets on offer. Around 85,000 head to the Fira Gran Via for eight halls' worth of shiny new things.

The week started off as per usual with me and my colleague, Ashleigh Allsopp, wandering round the show getting our hands on products, taking photos and videos of them to post on the web site. As we were leaving the Acer stand someone handed us each a small packet that contained a tiny pin badge. We thought it was quite cool, but we simply put it away and thought nothing of it.

However, the next day at the show we realised it was much more than a little giveaway that Acer had decided to do. That badge was in fact one of 124 designs that were available to collect at the show. Each a different character with a name from the firm's current 'be together, not the same' campaign. We suddenly felt like young

teenagers again in a sort of Pokémon 'gotta catch them all' type way.

Google had many partners at MWC showing off various devices running Android and it put something in place that changed the show entirely. Each of Google's partners was given a 2ft high Android statue to display - that reportedly cost \$10,000 - and each day those stands had exclusive Android pin badges to give away. Google has given away pins before, but not on this scale - a total of 200,000 were given out.

A handy map showed you which stands had the pins and which one they might give you. There were also two outside Android stands and Google staff walking around the show with satchels full of the pins who would gladly hand out any you hadn't collected, plus a candy lollipop - to match the name of the most recent version of Android.

It really changed the feel of the entire show and saw all kinds of people running around trying to get new pins - from PR women to business men in suits. It was quite a spectacle. Even people at the office were asking us to bring some back for them.

Some pins were harder to come by than others, and Google had even set up a site

where you could tick off which ones you had collected and trade duplicates with others at the show. There were many we wanted but just couldn't find and didn't realistically have the time to. Since returning from the show we discovered the most hard to find pins were found by locating a particular Googler and making sure you were wearing pins (most lined their lanyards with them) and they would give you a badge.

We quickly realised we wouldn't be able to collect them all but did our best. Handily, the stands we needed to visit were mostly ones handing out pins, though some that were listed on the special map seemed to have no idea about it - namely IBM and Nokia.

In the end, we managed around a third of the 124 goal, and we didn't particularly mind as it just made the show for us and for many others. I'm sure there will be copycat attempts at future shows, but it won't be the same as MWC 2015. ☒

CHRIS MARTIN





You look familiar

Why the Galaxy S6 makes Samsung look stupid

Samsung unveiled its new Galaxy S6 smartphone at MWC 2015, surprising us with its many similarities to Apple. Now, I love the iPhone, but I don't love everything about it. I love the design, for example, but I don't love the non-removable battery or the lack of microSD card slot, or the fact that it's not waterproof. Weirdly, Samsung seems to have taken several steps backwards with the S6, and those aforementioned Apple similarities are things we don't like about the iPhone, all of which the S6's predecessor boasted. What's going on, Samsung?

Yes, that's right, the S6 doesn't have a microSD card slot, so you'll have to pick from 32-, 64- or 128GB when you buy it in the same way that you have to with the iPhone 6. You won't be able to replace the battery easily, so if something goes wrong it's not a simple case of popping the back off and slotting in a new battery.

Additionally, damaging the horribly shiny glass back is worse than ever because you won't be able to simply buy a new one and pop it on. What's worse is that if you were used to the stress-free waterproof factor that came with the S5 you'll have

to readjust to the fact that if you drop the S6 down the toilet or into a puddle, it's probably going to be a costly mistake.


It seems that these sacrifices have been made in favour of a more premium design that does away with the plastic and introduces an iPhone 4/4s-like glass front and back, combined with sides that have an uncanny resemblance to the iPhone 6/6 Plus, complete with drilled speaker holes along the bottom and even a protruding camera on the rear. I think the new design is quite ugly, and the glass portions have a mirrored effect that take bling to a new level.

Samsung has been attacking Apple in its adverts for years, but this backtrack highlights one of the reasons its Apple-bashing ads were a mistake. When the S3 came out, for example, Samsung published its "it doesn't take a Genius" print ad comparing the new smartphone with the iPhone 5. Some of the qualities it mentioned about the S3 included the microSD card slot and the removable battery - looks like you'll need to cross those off the list now Samsung.

What's even weirder is how Samsung has backtracked when it comes to software, highlighting that the company has actually

taken away 40 percent of its software features as if that's something to brag about. If it was so unnecessary why was it there in the first place?

The S6 does still have a lot going for it. It has an amazing 577ppi screen, the powerful processor and that improved fingerprint scanner (one of the only qualities that we're glad it copied from Apple). The S6 Edge also offers additional option for those looking for something a bit more innovative, even if the edge doesn't actually do an awful lot.

But I'm not sure it's enough to stop Samsung's fans feeling let down by the decisions it's made with the S6. They have always had pride in being different from Apple, but now it's more difficult, and while it doesn't mean they'll suddenly become Apple fans, there are plenty of great Android competitors that have just become more appealing than ever. 

ASHLEIGH
ALLSOPP





Haptics to transform gadgets

The era of ubiquitous haptic user interfaces has been predicted for two decades. Now it's finally here

Haptics have been part of consumer electronics for a long time. When you put your smartphone on 'vibrate', or when you play first-person shooters on your Xbox, those vibrations are called haptics.

Most people are familiar with broad applications of haptics such as those. In the case of a phone, it's usually just a utilitarian vibration that you're supposed to notice. In the case of the Xbox game, the haptics help create a richer experience that strengthens the illusion or immersion into a game.

Three new uses for haptics in widely used consumer devices are helping to usher in what *Wired* called a "Neo-Sensory Age" of incredible haptics-enabled experiences.

The first is for augmenting the tactile experience of using hardware. The second is for conveying pattern-specific information. The third is for communicating.

Here's how all three will transform the experience of using your gadgets.

Augmenting the tactile experience of using hardware

Last year, Amazon launched two ebook readers and three Android tablets. One of the most interesting of these is the company's high-end reader, the Kindle Voyage.

To both the left and right of the Voyage's screen (which itself is textured to simulate the feeling of paper), Amazon designed touch zones for turning pages. A gentle squeeze on either side turns the page of the book you're reading in that direction, accompanied by a haptic vibration designed to substitute for the feeling of paper sliding across paper.

Likewise, the recently announced Apple MacBook has a touchpad that uses sophisticated haptics that add another dimension to the experience of using the hardware itself. The Apple Watch also has a 'Taptics engine' for providing some interesting and targeted haptic feedback.

When you turn the Watch's crown, which Apple has sub-branded the Digital Crown, there's an instant and specific haptic vibration that dances on your wrist to enhance the experience of feeling the metal scrolling wheel. When you draw on the screen, press the big button under the crown or do any number of things, Apple's Taptic engine will send physical sensations to your wrist to accompany those actions in a way that reinforces to your brain what you're doing.

And Samsung recently unveiled its Smart MultiXpress series of multifunction printers, which have a tablet-like user interface with haptics designed to simulate on-screen controls.

These new devices are all taking advantage of a new field of engineering called haptography, which involves recording physical sensations and later playing them back to simulate the action associated with the sensation that was recorded. Haptography is still in its infancy. As it becomes more sophisticated, our devices will gain a third dimension, with textures you can feel added to what you see and hear. Those cold, flat screens on mobile phones and tablets will come alive. All kinds of user interfaces, from car dashboards to refrigerator doors and TV remotes, will respond to our touch by touching us back. It will make these experiences more compelling and even addictive.

Conveying pattern-specific information

The Apple Watch also conveys pattern-specific information. For example, when using turn-by-turn directions in Apple Maps on the watch, the Taptics engine will give you directions by zapping the left or right side of the watch. You can follow the directions without looking at the watch, because the basic information is conveyed with vibration.

A new 2015 Mercedes hybrid car called the S550 includes haptic feedback that conveys critical information through your foot. Specifically, it sends a certain vibration through your foot that serves as a recommendation to back off on the gas pedal and coast to save juice or charge the battery. A different vibration tells you when the car switches from electricity to gas.

Wearable computing devices such as smartglasses (which, unlike Google Glass eyewear, look like regular glasses) will vibrate in specific ways to alert the user silently to different kinds of information.

Communicating

One of the most interesting applications of haptics is for communicating with other people. This is one of the most compelling uses for the Apple Watch. If you select a person from your list of favourites and then tap on the screen, the person you selected feels those taps (assuming, of course, that he or she is

wearing an Apple Watch). You can also send your heartbeat to that person's Apple Watch, and you both will see a beating heart on the screens of your watches and feel a haptic simulation of your heartbeat.

This is similar to numerous devices from startups, such as the Tactilu bracelet, which transmits touch from one person to another. As one user touches her bracelet, the other user feels it on his.

You'll be able to "reach out and touch someone" with your smartphone as a matter of course. Whatever you touch on its screen will be conveyed to the other person if he or she is holding a compatible phone. The generic vibration pattern of your phone's vibrate mode will be replaced by custom patterns of vibration for specific individuals, so you'll know who's calling without looking at the phone.

What's amazing about this isn't the practical laziness of having the information that a specific person is trying to reach you, but the psychological experience of near telepathy where you suddenly 'feel' a person's presence.


How haptics improve the user experience

We are just at the beginning of the 'Neo-Sensory Age'. Over the next couple of years, extremely lifelike haptics will be integrated into all kinds of devices. It will reach the point where consumer expectations will compel vendors to integrate high-quality haptics into all of their gadgets.

As we've seen with the Apple Watch, this will be especially true of wearable computing devices. In fact, some devices will use haptics as their only user interface.

Haptics will add depth and texture and – literally – a good feeling to computers, phones and wearable devices, as well as car dashboards and home automation appliances. They'll have some practical benefit, but mostly they'll make us love our gadgets more.

The world of ubiquitous haptic user interfaces has been predicted, promised and hinted at for two decades. Now it's finally here.

Can you feel it? 

MIKE ELGAN



Crafting PCs the Scan way: Specification. Service. Satisfaction.



Scan V1 Value System Home / Office PC

- Intel® Pentium® G3240 processor
- 4GB Corsair DDR3 1333MHz memory
- 500GB SATA 6Gb/sec hard drive
- Windows 8.1

£299 Inc VAT

The V1 is a very capable entry-level system perfect from basic home/office tasks. It's based around the dual-core Intel® Pentium® G3240 processor, 4GB of RAM plus a 500GB hard disk.



Scan V15 Value System Home / Office PC

- Intel® Core™ i5 4460 processor
- 8GB Corsair DDR3 1600MHz memory
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1

£489 Inc VAT

The V15 ups the ante by including a quad-core Intel® Core™ i5 4460 processor, so it makes light work of office and multimedia applications.



Scan G20 Value System Gaming PC

- Intel® Pentium® G3240 processor
- 8GB Corsair DDR3 1600MHz memory
- 2GB NVIDIA GeForce GTX 750 Ti SSC
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1

£489 Inc VAT

Thanks to its dual-core Intel® Pentium® G3240 processor and NVIDIA GTX 750 Ti SSC graphics card the G20i is our most affordable gaming PC. It even includes surround sound!



Scan G30i Value System Gaming PC

- Intel® Core™ i5 4460 processor
- 8GB Corsair DDR3 1600MHz memory
- 2GB NVIDIA GeForce GTX 760 SC ACX
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1

£685 Inc VAT

The combination of quad-core Intel® Core™ i5 4460 processor and NVIDIA GeForce GTX 960 SSC ACX graphics card ensures that the G30i can play any game you throw at it.



Get the best of work and play with the new Windows.



Scan Value PCs

A range of computers perfectly suited for the home/office. These affordable PCs are very flexible workhorses, capable of every task, from email/web surfing to high-end applications such as photo editing, video encoding and gaming. All of our Value Systems are pre-built and soak-tested so are ready to ship for next-day delivery.



Finance Available on
PCs above £300



Built by award
winning 3XS team



Fully soak tested



Fully 3XS
compatible



Ready to ship



2 Year Warranty
Part + Labour



The most awarded PCs and Laptops Period.

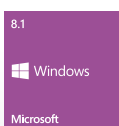


Scan 3XS Gamer Gaming PC

- Intel® Core™ i3 4160 processor
- 8GB Corsair DDR3 1600MHz memory
- 2GB NVIDIA GeForce GTX 750 Ti
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1
- 3 Year Premium Warranty

£559 Inc VAT

The Scan 3XS Gamer is an affordably-priced gaming rig that includes a dual-core Intel Core i3 4160. Also included in the default spec is a 2GB NVIDIA GeForce GTX 750Ti graphics card, 8GB of 1600MHz Corsair Vengeance DDR3, a Asus H81 motherboard and 1TB hard disk.

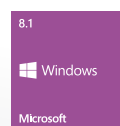


Scan 3XS Gamer 20i Gaming PC

- Intel® Core™ i7 4790 processor
- 8GB Corsair DDR3 2133MHz memory
- 4GB NVIDIA GeForce GTX 970 SC ACX
- 1TB Seagate HDD
- Windows 8.1
- 3 Year Premium Warranty

£1054 Inc VAT

The 3XS Gamer 20i is a super-fast gaming PC thanks to its combination of quad-core Intel Core i7 4790 CPU running at 3.6GHz with added Hyper-Threading plus a 4GB NVIDIA GeForce GTX 970 graphics card. These components are installed in an Asus Z97-K motherboard along with a 1TB hard disk.

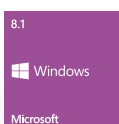


3XS Graphite LG157 Gaming Laptop

- Intel® Core™ i7 4720HQ processor
- 8GB Corsair DDR3 1600MHz memory
- 2GB NVIDIA GeForce GTX 960M
- 15.6in 1,920 x 1,080 screen
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1

£935 Inc VAT

The LG157 is a 15.6" mid-range gaming laptop that includes a NVIDIA GeForce GTX 960M graphics card plus an Intel Core i7 4720HQ CPU, up to 16GB of RAM and multiple hard disks and SSDs. The LG157 is ready for next-day delivery in late March and is protected by a 2 Year Premium Warranty.

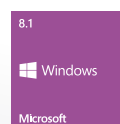


3XS Graphite LG1720 Gaming Laptop

- Intel® Core™ i7 4720HQ processor
- 8GB Corsair DDR3 1600MHz memory
- 3GB NVIDIA GeForce GTX 970M
- 17.3in 1,920 x 1,080 screen
- 1TB SATA 6Gb/sec hard drive
- Windows 8.1

£1159 Inc VAT

The LG1720 is a 17.3" high-end gaming laptop that includes a choice of powerful NVIDIA GeForce GTX 970M or 980M graphics card, ensuring silky smooth frame rates in all games. The LG1720 is ready for next-day delivery and has a 2 Year Warranty.



Scan Computers recommends Windows.

3XS Custom Series

Our 3XS Custom Series is a range of computers designed to offer the best performance for a variety of applications, with a particular focus on games. We build Custom Series PCs to order, so we can configure and tailor make an individual PC just the way you want it. We can also overclock the processor, so you get a faster PC without a substantial increase in price. All 3XS Custom Series PCs are covered by a three year warranty as standard with the first year on-site.



Scan 3XS Overclocked



Built by award winning 3XS team



3 Year Warranty

3XS SYSTEMS

Despite its design, One M9 unlikely to be HTC's knight in shining armour

The company will once again face competitors with higher marketing budgets, and this time they have better products as well, explains [Mikael Ricknäs](#)



The One M9 may be a knockout, but it's not likely to save HTC. The device looks similar to its predecessor at a time when competitors have multiplied and stepped up their game, making it even harder for the struggling company to make a mark in the high-end segment.

Design has, since the launch of the first One model, been HTC's biggest strength. The One M9, however, doesn't have the same wow factor as its predecessors since the design is no longer as groundbreaking.

"To most consumers the One M9 will look almost identical to the One M8, which preceded it, and that's a big challenge for HTC," explained Ben Wood, chief of research at CCS Insight.

This feeling of déjà vu is highlighted in our review on page 34. HTC's uphill battle is made more difficult by advancements made by Apple and Samsung, with bigger screens on, respectively, the iPhone 6 and 6 Plus, and the design and hardware of the Galaxy S6 and S6 edge.

Samsung is under pressure to improve sales after a disappointing 2014, and is about to unleash the biggest marketing campaign in its history, which HTC can't

hope to match, according to Wood. Also, the fact that the Galaxy S6 costs the same yet has more impressive specs than the One M9 is bad news for HTC.

The One M9 will also face new competitors in some parts of the world, including the Note Pro from Xiaomi, which has more integrated storage, RAM and more pixels per inch.

High-end products serve two purposes: to generate sales and propel the rest of a company's portfolio. Not having a successful flagship smartphone has been a problem for HTC for some time.

The company's shipments fell by 2 percent year over year in the fourth quarter, while the overall market grew by 31 percent. It was the vendor's twelfth straight quarter of global volume decline and it continued to lose traction in the important North America and China regions, according to market research company Strategy Analytics. HTC's market share was a measly 1.2 percent, it said.

Declining unit sales can make life more difficult for smartphone vendors. It becomes harder to secure the best components since chipmakers prioritise larger competitors. From that point of view, Samsung's choice

of its own processor over Qualcomm's Snapdragon 810, which powers the One M9, was a good thing for HTC.

To grow, HTC plans to launch more mid-range smartphone models in key territories like Taiwan (its home market), and to expand into tablets and wearables. However, a more diversified product portfolio will take resources and time to develop - time and money that HTC simply does not have in its current weakened state, according to Strategy Analytics.

Wood is bit more upbeat in his assessment of HTC's expansion: "Partnering with Under Armour on the Grip fitness band and with Valve on the Vive virtual reality headset are smart moves," he enthused.

Strategy Analytics thinks the best option for HTC is to merge with a company like Xiaomi or Huawei Technologies - both Chinese companies. The rationale for such a deal would be the same as the strategy behind Lenovo's acquisition of Motorola Mobility from Google: to combine forces for a bigger footprint in global markets. However, mergers and acquisitions are always risky, and a smartphone market without HTC would be a little less exciting. ☒

Here are the components that will power your next smartphone

Qualcomm, MediaTek, Samsung and LG are all working on exciting new products, [Mikael Ricknäs](#) reports

The past couple of months have seen the launch of a clutch of new smartphones – and also new chipsets that aim to make the next generation of smartphones more powerful and simpler to recharge.

Competition between processor makers is increasing, with companies spurring each other to improve smartphone performance. Here are some of the components and technologies that will help make it happen:

Qualcomm's next-generation chips

The Snapdragon 820 will be the first processor to use Qualcomm's homegrown ARM-based Kryo architecture – and also the first to use the company's new Zeroth platform for adding machine learning capabilities. The company plans to make samples available to phone manufacturers in the second half of the year. Qualcomm will need to have the chips ready for mass production in the first half of 2016 to catch the next wave of high-end smartphone launches, or manufacturers may look elsewhere – as Samsung did this year, choosing to use one of its own Exynos processors for its Galaxy S6.

In February, the company also launched four new processors for mid-range smartphones, including the Snapdragon 620. This eight-core processor integrates LTE-Advanced and has enough power to shoot 4K video at 30 frames per second. The first devices containing it will go on sale during the second half of the year.

All this doesn't change the fact that Qualcomm will still face stiff competition from companies such as MediaTek and Intel, which despite all its struggles in the mobile space doesn't seem ready to give up anytime soon. Also, if the Samsung's Galaxy S6 and S6 edge become big successes it might embolden the company to use its own Exynos processors in more products.

LG's Neo Edge screen technology

Smartphone vendors try to tempt us to upgrade with screen improvements.



SNAPDRAGON 820

Typically, they target screen size and resolution, but these have reached a plateau, especially on high-end products, so display makers are turning their attention to other areas, including the size of the bezel.

At the end of 2014, LG Display said it had developed a 5.3in full HD panel for smartphones with the world's narrowest bezel at 0.7mm – less than the thickness of a credit card. The development has been possible thanks to a technology LG calls Neo Edge, which uses an adhesive instead of double-sided tape to attach and completely seal the edges of the panel's circuit board and backlight unit.

Hopefully, the company will be able marry the technology higher resolution screens, as well. On screen sizes around 5.5in just a couple of millimetres can do a lot to improve handling. Even if it can't, the 5.3in screen could if combined with the Snapdragon 620 processor and Samsung's new 128GB storage module form the basis of a really competitive mid-range smartphone.

Samsung's 128GB integrated storage module

One area where affordable smartphones have trailed their more expensive counterparts is integrated storage size, but a chipset Samsung launched recently may signal a change. The company's new 128GB storage product is targeted at mid-range smartphones and tablets, the company said.

Even though high-end smartphones

use storage with better performance, the development adds to the attraction of budget smartphones, which have recently improved to such an extent that they make


it harder to decide whether buying higher-end models is really worthwhile.

Samsung expects to see devices with 128GB of storage in the near future. To what extent that happens remains to be seen, but it seems unlikely since vendors like to upgrade their products in small increments, and many existing models have just 8GB of storage today. Samsung hopes vendors will forego microSD card slots and instead use its chipset to keep consumers happy. That's what the company has already done on its own Galaxy S6 and S6 edge.

Wireless charging chipset from MediaTek

So far, wireless charging has mainly been an option on high-end smartphones, but that looks likely to change this year. This month MediaTek launched a chipset that aims to make the technology available on more affordable devices.

One of the main advantages with the MT3188 is compatibility with all existing standards for wireless charging, so users aren't limited in what chargers they can use. The chipset is currently in mass production and will be adopted by smartphones as well as tablets and wearables, according to MediaTek.

Chip maker NXP Semiconductors is also helping lay the groundwork to boost wireless charging adoption. The company recently introduced a reference design that will help cut the cost of wireless chargers based on the Qi specification. A reference design is a blueprint that makes it easier for vendors to build products, in this case a charger based on NXP's components. 

SAMSUNG GALAXY S6



Microsoft to support 8K video resolutions with Windows 10

8k displays aren't here yet, but Microsoft's looking forward with Windows 10 says [Agam Shah](#)



Microsoft is looking beyond 4K with Windows 10 and bringing 8K support to the operating systems, years before TVs, monitors and content for that display resolution become widely available. The support will be for displays larger than 27 inches, according to a slide presented at Microsoft's WinHEC trade show in Shenzhen, China, recently.

Large-screen TVs based on the 8K resolution have wowed many at trade shows such as CES, but it's many years away from adoption. Users are still moving to from conventional HD to the new 4K standard, and it could be many years until PC displays start supporting 8K.

All major television makers have shown prototype 8K displays. Japan's NHK is testing 8K broadcasts in time for the 2020 Olympics, which will be held in Tokyo. 8K displays will show images at a 7680x4320 resolution. Support for 8K will be built in to Windows

10 for PCs, and 8K monitors will need to be attached to display ports. PC makers may also come out with 8K all-in-ones in the future.

TV makers have already proposed a new SuperMHL connector for 8K video, and the Video Electronics Standards Association (VESA) has proposed the Embedded DisplayPort (eDP) 1.4a standard to support 8K in laptops, mobile devices and PCs.

Windows has always been a strong gaming and multimedia platform, and when 8K does come out, enthusiasts like gamers won't have to wait for a new operating system to support that resolution. But PCs would need beefy hardware, and native Windows 10 support could encourage the development of advanced hardware. Graphics card makers nVidia and AMD support 4K at acceptable frame-per-second rates and are also working to support 8K.

It may take many years for 8K to become practical, so meanwhile Microsoft

has prepared Windows 10 for 4K. The OS will support 4K resolutions on PCs with screen sizes of eight inches or higher, and on small-screen tablets and smartphones with screen sizes of six inches and higher, according to a slide from the presentation.

The operating system supports the 4K video codec HEVC (High Efficiency Video Coding), also called with H.265, which is being promoted by the International Telecommunications Union. Microsoft in its slides made no mention of a different 4K video codec called VP9, a royalty-free video standard from Google already being adopted by major TV and chip makers.

Microsoft also shared details about PlayReady 3.0, a Windows 10 digital rights management platform to secure video and streaming content. PlayReady 3.0 will use a hardware-based technology to protect content streams to tablets, smartphones and computers. [\[X\]](#)

Acer adds horsepower to Chromebook with Intel Broadwell chip

Agam Shah says Acer is pumping more horsepower into its Chromebook C910 with an optional Intel Core i5 processor based on the Broadwell architecture

Acer is pumping more horsepower into its Chromebook C910 with an optional Intel Core i5 processor based on the Broadwell architecture.


The laptop, which has a 15.6in screen, has been available with Core i3 or Celeron processors. The Core i5 processor will add more application and graphics performance to the laptop.

Intel's Core chips based on Broadwell are also used in Google's high-end Chromebook Pixel, which was announced recently starting at £799 with a Core i5 processor. But the Acer Chromebooks are reasonably priced by comparison, and the C910 with Core i5 is priced at \$499 (£338).

Chromebooks are targeted at those who do most of their computing on the web; an internet connection is needed for most applications. Acer is calling the C910 with Core i5 the fastest commercial Chromebook. Most Chromebooks are low-cost laptops running on Atom chips or Core or Celeron processors based on the Haswell microarchitecture, which is the predecessor to Broadwell.

The C910 also stands out for its big screen, which is the largest Chromebook on the market. The Core i5 laptop weighs 2.2kg and offers 4GB of RAM and 32GB of storage. The laptop comes with a full-high definition screen.



Other features in the laptop include 802.11ac Wi-Fi, USB 3.0, USB 2.0, HDMI ports and an SD card reader. The laptop is available now, and specifications could vary based on country. 


Google picks London for its first shop-within-a-shop

Google has opened its first shop-within-a-shop in London, yet another retail experiment by the company, which already has counters in third-party stores, says **Mikael Ricknäs**

Located inside the Currys PC World store on Tottenham Court Road, Google's first shop-within-a-shop features Google's Nexus devices, Chromebooks and other products.

It's not a full blown retail outlet like Apple's huge and sophisticated stores, but more of a modest test balloon for the search giant. It builds on dedicated areas Google has already in big electronics shops.

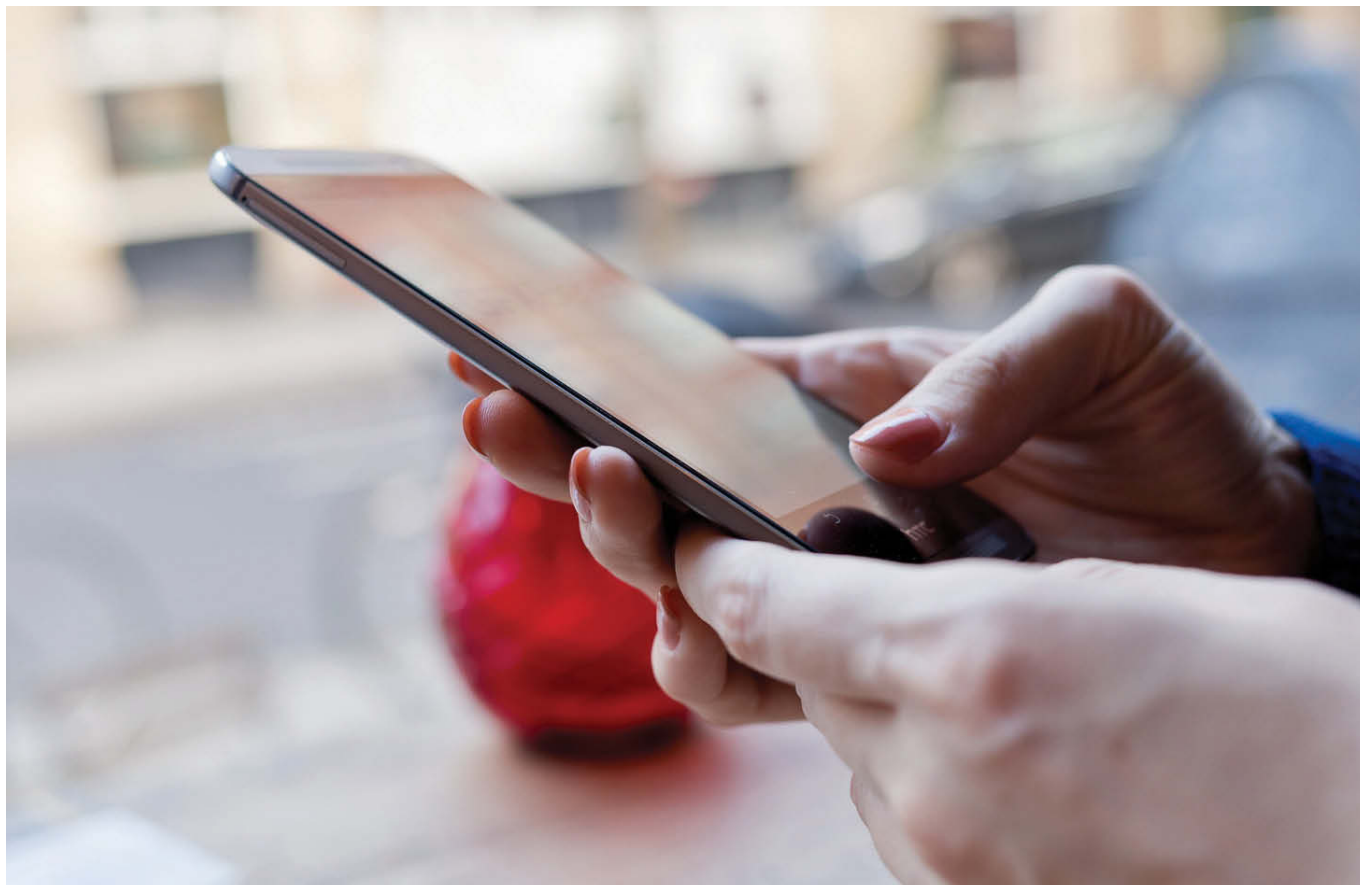
Although not very big, the store is prominently located by the entrance, so it's impossible to miss. Shoppers can test and buy Google's Android phones and tablets, as well as Android Wear smartwatches and Chromebook laptops from partners such as LG Electronics, Motorola, HP and Asus.

To attract visitors, Google has also built a doodle wall where digital spray cans are used to create new versions of the company's logo. There is a huge Google Earth screen and a Chromecast Pod, in which customers can watch YouTube videos, as well. 



Wireless router from Huawei hints at new ways to speed up LTE

Huawei uses the 3.5GHz band to offer speeds at up to 220Mb/s with LTE-Advanced, says [Mickael Ricknäs](#)



In the hunt for more spectrum to offer higher wireless broadband speeds, mobile operators and equipment vendors are showing a growing interest in a new candidate.

Huawei Technologies has laid the groundwork for speeds up to 220Mb/s using LTE-Advanced at 3.5GHz. The company recently launched the world's first device, a wireless router that combines the speedy network technology with that frequency band.

The amount of spectrum is one of the things that determines what speeds a network can offer. The 3.5GHz band is an ideal candidate for offering high speeds because it has a lot of spectrum available, according to Huawei. What the vendor does not mention is that using the higher band also means worse coverage than that offered with current networks.

The Huawei wireless router uses so-called carrier aggregation to get to 220Mb/s. The



HUAWEI 3.5GHZ WIRELESS ROUTER

technology is part of LTE-Advanced and lets operators treat multiple radio channels (in this case two) in different or the same frequency bands as if they were one. Huawei didn't offer any other product details.

There is a growing momentum around the 3.5GHz spectrum, according to the company. At the end of 2014, Japanese mobile operators were awarded this spectrum for their LTE-Advanced network deployments.

In the Americas, operators in Canada, Argentina and Peru are currently rolling out 3.5GHz spectrum LTE networks, according to Huawei. Its router would also be a good fit for the 3.5GHz spectrum, which the FCC is working on making available in the US. The spectrum band is available for use in Europe, but hasn't taken off, a situation that more availability of 3.5GHz devices could change.

With hype around higher LTE speeds growing, it's important to remember that real-world speeds aren't as high as those quoted by equipment makers. A report published by Opensignal found that the average global LTE download bandwidth was 9.3Mb/s between November 2014 and January 2015. The average speeds in the US, UK and Germany were 7-, 12- and 13Mb/s, respectively. ☒

USB Type-C is here at last

USB Type-C peripherals are on the way and storage devices are first up, says [Agam Shah](#)



APPLE MACBOOK & TYPE-C CABLE

With Apple's latest MacBook and Google's newest Chromebook Pixel just announced both

featuring the new USB Type-C connector, we're on the lookout for peripherals that use the interface, and storage devices appear to be first out of the gate.

Because the Type-C connector can be used to recharge laptops, it may ultimately do away with the need to carry bulky power adaptors. Like older USB technology, Type-C will also connect monitors, external storage drives, printers, cameras and other peripherals. One beauty of the system is that cables have the same connector on both ends, and can be inserted into ports without worries about which side is up or down.

Storage devices will eventually benefit from Type-C's USB 3.1 protocol, which can transfer data at 10Gb/s (bits per second), double that of USB 3.0. But the first peripherals we're seeing support only USB 3.0 speeds.

Hard drives

LaCie, which is well-known among Mac users, announced new Porsche Mobile Design portable drives. They're designed to work with Apple's new 12in MacBook, and also are compatible with the Mac OS Time Machine backup software.

The drives also have traditional Type-A USB 3.0 ports to ensure compatibility with existing Macs that don't have the Type-C connector. The portable drives will ship next quarter and be available in capacities of 500GB, 1- and 2TB. We expect portable storage companies Samsung, Seagate, Toshiba and Western Digital to follow suit and release USB Type-C portable hard drives and SSDs.

GOOGLE CHROMEBOOK PIXEL



Flash drives

Emtec has announced Duo USB-C 16-, 32- and 64GB thumb drives with Type-C and Type-A connectors. Beyond Apple's MacBook, the flash drives can be used with Nokia N1 tablet and Google's Chromebook Pixel, which are the only other devices with Type-C ports at the moment. The Duo USB-C drives provide read speeds of 110MB/s and write speeds of 20MB/s, which are not overwhelming, but in line with speeds of other USB 3.0 flash drives.

Another 32GB flash drive with USB Type-A and Type-C ports was announced by SanDisk. The Dual Drive Type C will connect into PCs and Macs. Expect to see them in shops in the second half of 2015.

Cables

Apple's introduction of the USB Type-C for the first time in its 12in MacBook will have users scrambling to upgrade cables so the laptop can connect to Apple's iPad, iPhone and other existing peripherals. Apple is selling a standard USB Type-C to USB


converter for £15, a 2m extension and charge cable for £25, and a USB Type C power adaptor for £39. It's also selling a £65 USB Type C Digital AV Multiport Adaptor, so the new MacBook can simultaneously connect to a 1080p HDMI display, USB 3.0 device and a USB Type C charging cable. £65 will also buy you a USB VGA Multiport Adaptor, which is similar to the Digital AV adaptor, but with a VGA port instead of an HDMI port.

Apple now sells a Lightning to USB 2.0 converter, so it's possible it may in future offer a USB Type-C to Lightning converter to connect iPhones and iPads.

Cheaper cables

Amazon is selling a handful of inexpensive USB Type-C to Type-A converters, which could help connect existing peripherals to Type-C ports in the newer computers. The most expensive cable from Aukey is priced at £12.99, and the cheapest is priced at £5.99 by UCEC.

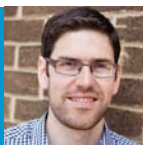
USB Type-C for desktops

If you're building a desktop, scouring online retailer sites could lead you to motherboards with support for USB Type-C ports. These support the newer USB 3.1 protocol, and are capable of moving data at speeds of up to 10Gb/s. Asustek's Rampage V Extreme boards for gaming desktops is selling for a whopping £340, but it supports the newer DDR4 memory and the latest Intel processors. Other Asus motherboards with the older DDR3 memory and USB 3.1 ports are being sold at prices ranging from £159 to £259. MSI is also bringing Type-C connectors to a range of motherboards. 



TYPE-C USB CABLE

CHRIS
MARTIN



MWC 2015 brought us a look at the best new smartphones, tablets and wearables for the year, so here's our pick of the show from Barcelona



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^ Samsung Galaxy S6

Smartphone

It's smartphone season and Samsung has introduced its new flagship Galaxy S6, now with a sleek design featuring a metal frame and glass rear cover. It has a Quad HD screen, 16Mp rear camera and Samsung's own Exynos 7420 octa-core processor. Unfortunately, the microSD card slot and waterproofing are both gone.

£599 inc VAT
samsung.com/uk

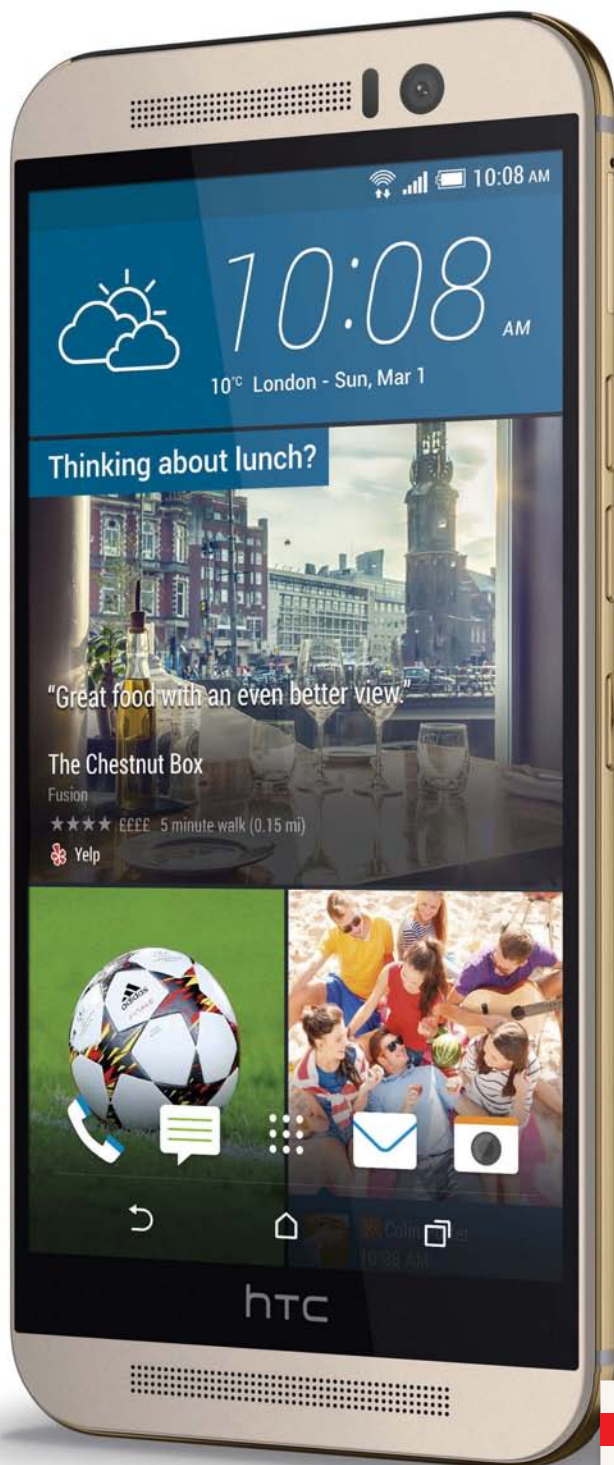
^ Samsung Galaxy S6 Edge

Smartphone

Instead of a mini version, Samsung unveiled the S6 Edge alongside the regular version. It shares the same core specs, but has a 'dual edge' display meaning it curves down both sides. This not only improves the design, but gives it additional features such as the People Edge. It will cost you a lot more, though.

£760 inc VAT
samsung.com/uk

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HTC One M9

Smartphone

HTC's new flagship smartphone is a simple evolution of the original HTC One. This time the unibody aluminium shell is two-tone in colour and still feels great. The firm has stuck with a Full HD 5in screen but upgraded the camera to 20Mp and the processor to a Qualcomm Snapdragon 810.

£579 inc VAT

htc.com/uk

» Sony Xperia M4 Aqua

Smartphone

MWC didn't deliver the Xperia Z4 flagship, instead this mid-ranged beauty. As the name suggests, it's waterproof and there's no longer a flap for the Micro-USB port. Hardware includes a 5in HD screen, Qualcomm Snapdragon 615 processor and a 13Mp rear camera. Like other new phones, it's preloaded with Android 5.0 Lollipop.

£299 inc VAT

sonymobile.com/gb



^ Huawei Watch

Smartwatch

One of the surprise products of MWC was the simply named Huawei Watch, which is a circular smartwatch with Android Wear. It comes in three different colours and with leather or metal straps. Like rival devices, it has a Snapdragon 400 chip, 4GB of internal storage and a heart rate monitor.

£300 inc VAT

huaweidevice.co.uk



HTC Re Grip



Activity tracker

HTC's first wearable is called the Re Grip and has been made in partnership with Under Armour. It's compatible with both iOS and Android and can provide notifications from your phone. Furthermore, the Grip is waterproof, made of breathable material and has GPS built-in.

£TBC

htc.com/uk

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Sony Xperia Z4 Tablet <<

Tablet
Without replacing the Z3 range, Sony has added to it with the Xperia Z4 Tablet: a new 10in device that's even thinner and lighter at 6.1mm and 389g. The display is now 2560x1600, there's a Qualcomm Snapdragon 810 processor and the tablet comes with a Bluetooth keyboard creating a laptop-like experience.

£499 inc VAT
sonymobile.com/gb

>> LG Watch Urbane

Smartwatch

LG has introduced its third Android Wear smartwatch, this time with a luxury polished silver or gold finish. It's supplied with a leather strap but can be replaced with any 22mm strap. The device is otherwise much the same as the G Watch R with a 1.3in round POLED screen, 4GB of storage, a heart rate monitor and IP67 waterproofing.

Around £300
lg.com/uk



Microsoft Lumia 640 <<

Smartphone

We're still waiting for a new flagship Windows Phone but for now the Lumia 640 is attractive and affordable. Like the M4 Aqua, it's 5in and HD, but there's an XL model if 5.7in is more your thing. Key specs include 4G LTE support, a microSD card slot and an 8Mp rear camera.

£150 inc VAT
microsoft.com/en-gb





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Specifications

13.3in (1920x1080, 166ppi)
AHVA matt anti-glare display; 800MHz Intel Core M-5Y10c (2GHz Turbo) 2C, 4T; Intel HD Graphics 5300; 8GB 1600MHz LPDDR3 RAM; 128GB SanDisk M.2 SSD; 802.11a/b/g/n/ac 2x2 MIMO (Intel Wireless-AC 7265); Bluetooth 4.0; 3x USB 3.0; Micro HDMI; SD card; stereo speakers; 0.9Mp webcam; built-in mic; 3.5mm headset jack; UK tiled keyboard; 105x73mm buttonless trackpad; 45Wh lithium polymer battery; 45W wall adaptor; 324x225x12.3-12.8mm; 1197g

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



ULTRAPORTABLE

Asus ZenBook UX305F

The ZenBook UX305F is a 13.3in ultraportable, a near clone of the 13in MacBook Air in terms of its chassis shape, profile and all-metal solid construction. It differs in its smaller but higher-resolution screen, which benefits from IPS-like AHVA technology and a matt anti-glare finish. This display has 1920x1080 pixels, and this full-HD resolution in a 13in frame is arguably the best compromise for a Windows computer display, since the operating system does not scale reliably beyond 150 percent.

Powering the UX305F is an 800MHz Intel Core M-5Y10c processor, built on a new smaller 14nm process. This can be overclocked in short bursts by Intel's Turbo Boost technology, up to 2GHz.

It's a dual-core chip with Hyper Threading like the popular Core i5 and i7 processors, so can work on four threads like a quad-core processor. Most notable is its low thermal design power (TDP) figure of 4.5W, allowing its use in laptops without a cooling fan. That in itself is an incredible breakthrough, making for a silent design with no moving parts apart from the keyboard, trackpad and screen hinges.

The UX305F is relatively well-equipped in ports and connectors by the standards of ultraportables, featuring three USB ports, all of USB 3.0 specification, plus Micro-HDMI video output, headset jack and SD card slot.

Its wireless capabilities run to the now-ubiquitous Bluetooth 4.0 and



dual-band 11ac Wi-Fi. This is a two-stream solution too, with maximum signalling speed of 867Mb/s and potentially better range than the most basic single-antenna cards found in budget laptops.

Working with the Core M processor is 8GB of low-power 1600MHz memory and a 128GB SSD from SanDisk. This latter part is one of the new generation M.2 types and here connected to a regular SATA Revision 3 bus.

The keyboard has the same keys and general layout as the MacBook Air, with the Ctrl and Fn keys reversed, as are the Alt and Windows keys. The trackpad look similar, about the same size at 104x73mm (76mm for the Air) but is a lower grade component without the same precision in mouse steering and multi-touch control.

The display is unusually good for a Windows laptop though, using IPS-like technology that gives wide viewing angles and better colour gamut. This AHVA (advanced hyper viewing angle) display is made by AU Optronics, and lived up to the manufacturer's spec with a measured 860:1 contrast ratio, and an sRGB colour gamut of 93 percent (69 percent Adobe RGB). It does have poor listed response time of 25ms, although we did not notice significant blurring in the limited game benchmarks we ran.

It colour accuracy was good, with a spread from 0.25 to 5.95 Delta E, and an average of 0.92 Delta E. The overall performance of this AHVA technology screen is quite impressive when you consider it is only a 6-bit per pixel panel, specified with only 262,000 colours rather than the

millions of colours we find with most of today's 8-bit panels.

The Geekbench 3 benchmark scored the ZenBook UX305F with its Core M processor with 2188 points single-core mode, and 4323 points multi-core mode. Those are far from record-breaking scores, more in line with the iPad Air for example, which was slower in single-core mode (not benefitting from an overclock to 2GHz) at 1815 points; but slower than an iPad in multi mode, where the tablet scored 4516 points.

It is the graphics processor in the Core M that stands out as rather competent, given the wound-down nature of the main CPU. This is an Intel HD Graphics 5300 integrated engine, with 300MHz base clock and 800MHz maximum.

In our Batman: Arkham City test at 1280x720 resolution, it averaged 25fps at Medium detail, rising to 28fps with Low detail. That's borderline gameable, which we weren't expecting from this 800MHz CPU with integrated graphics.

With its SanDisk 128GB SSD, we recorded sequential reads and writes at 446- and 349MB/s - decent results for this capacity of drive. Looking at smaller transfers, 4kB random reads and writes measured 24.9- and 48.4MB/s, rising to good results of 293- and 237MB/s at queue-depth 32.

In our battery run down test playing HD video over a Wi-Fi link, with screen set to 120 cd/m², it survived for close to 10 hours - nine hours, 58 minutes in fact. That's approaching the kind of battery life we want to see - around 12 hours in this looped video test would be better, to allow for more challenging moments of use and then still able to last through an eight-hour working day.

Verdict

At £650, the UX305F is an attractive package. **Andrew Harrison**



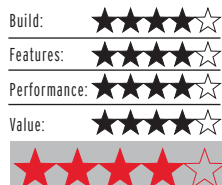
£220 inc VAT

Contact

■ acer.co.uk

Specifications

2.1GHz nVidia Tegra K1;
quad-core CPU; 4GB
DDR3L RAM; 32GB SSD
storage; 13.3in TN display,
full HD (1920x1080)
resolution; 2x USB 3.0;
HDMI; 3.5mm headphone
socket; SD card reader;
802.11ac Wi-Fi;
18x327x227.5mm; 1.5kg



CHROMEBOOK

Acer Chromebook 13

While Chromebooks continue to grow in popularity there's also been another area of expansion worth noting, that of screen size. There are 14in models from HP (Chromebook 14) and Toshiba (Chromebook 2), and now Acer now throws its hat into the ring with a new 13.3in variant to accompany its very fine C720 range of smaller devices.

The white plastic chassis of the Chromebook 13 is pretty unremarkable if truth be told. The matt finish is certainly preferable to some glossier machines we've encountered, but the chunky hinge area looks perfunctual and somewhat bland design-wise. The joins feel sturdy though, which is the most important thing, and there are several useful ports scattered around the body.

The left flank offers a USB 3.0 port and an SD card reader, while the right houses the headphone port and charging socket. This might seem a little miserly, but around the back there are also an additional USB 3.0 and HDMI output, presumably arranged this way as the slim sides of the machine offer little room for ports of this size. We have to say, after using a similarly designed Samsung Chromebooks for years, that having USB ports at the back is not an ideal placement. Sure it means you can taper the flanks and avoid bulky construction, but from a user point of view it's just a bit awkward.

Opening up the Chromebook 13 reveals a clean, spacious keyboard set in black to nicely contrast the white body. In use it's responsive and easy to type on, although we would prefer if manufacturers stopped placing keys so close to the enter key. It's a niggle, but one that makes little sense to us, especially on a machine like a Chromebook. The trackpad is smooth and accurate, with all the multi-touch, navigation gestures included in Chrome OS executed with little fuss.

Of course, one of the main features of the Chromebook 13 is the screen, which boasts a full HD resolution of 1920x1080. This is another relatively new thing in Chromebooks, with only the £799 Pixel, and Toshiba's Chromebook 2 being able to make such a claim.



The difference between those devices and this though is that the others come with IPS panels, while Acer opted to use the more standard TN display on its machine. The difference is stark. While the rendering is sharp, colours are muted and pale, and the frosty panel just looks somewhat lacklustre when compared to the vibrant Toshiba. In fact that screen is really the biggest problem for the Acer. Six months ago this device would have been impressive, and to be fair in many ways it still is, but it's hard to recommend when you know that for only a small amount more you can get a system that has a far better display.

The Acer does, however, have a lot going for it. The nVidia Tegra K1 Quad-Core CPU is fast, and was able to cope with plenty of open tabs, streaming video in the background, and barely skipped a beat as we continued browsing various websites. This is aided by the 4GB of RAM under the hood, something we're very glad to see as the 2GB often found in earlier Chromebooks could result in stifled performance.

In our SunSpider benchmarks the Acer scored 660ms, which placed it at the lower end of the scale, but in everyday use we found the device quick to load up web pages and had no complaints.

Battery life is also good, with our tests draining it dry in nine hours, 20 minutes, making it one of the longest lasting Chromebooks yet.

Sound is also decent, with the twin underside speakers outputting respectable levels with a good range of tones. Wi-Fi supports 802.11ac, which is good to see, and while the 32GB of internal

storage might seem small, but it's generous for this class of machine. It's augmented by the two years of free 100GB Google Drive space that comes with all new Chromebooks.

The normal caveats apply when you consider buying a Chromebook. In essence, you have to be happy to do most of your activities in the cloud, using Google services.

You also need to factor in that Chromebooks can't run Windows software such as Photoshop and iTunes, as they just won't work on the platform and are unlikely to appear in the future. If this isn't an issue, then we think you'll find Chrome OS an easy-to-use system.

The online apps, plus normal web-based services, mean you can get an awful lot done on one of these machines, and the streamlined interface (in essence a browser) will be familiar to everyone. Google's office suite (Docs, Sheets, and Slides) is a very good option for normal day to day tasks that don't rely too much on advanced formatting, plus you can also access the online versions of Word and Excel if you want your Microsoft fix.

The Chrome App store continues to grow, with loads of useful tools for productivity, entertainment, and content creation, most of which are free. A number of apps can also work offline too, with the Google suite being the most notable.

Verdict

Acer knows how to make good, solid, reliable Chromebooks, and this model is no exception. If you can accept the screen, it's a very nice machine that will get the job done.

✉ **Martyn Casserly**

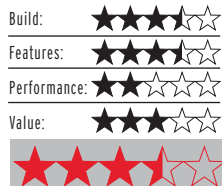
£329 inc VAT

Contact

■ toshiba.co.uk

Specifications

11.6in (1366x768, 135ppi) TN gloss touchscreen; 2.16GHz Intel Celeron N2840 (2.58GHz Burst) 2C, 2T; Intel HD Graphics; 4GB 1600MHz DDR3L RAM; 500GB 5400rpm HDD; 802.11b/g/n; 1x1 MIMO; Bluetooth 4.0; 1x USB 3.0, 1x USB 2.0; HDMI; SDXC card slot; stereo speakers; single mic; webcam; 3.5 mm headset port; UK layout, tiled keyboard; 85x43mm, two-button trackpad; 26Wh non-removable lithium-ion battery; 45W mains adaptor; 287x198x22.5mm; 1309g



LAPTOP

Toshiba Satellite Radius 11

The Toshiba Satellite Radius 11 is a budget Windows laptop with 11.6in touchscreen. Just like the Lenovo Yoga 3, its display can spin right around to make a clunky tablet. Costs have been cut to bring the price down to £329 by direct sale from Toshiba's website, although various compromises will undermine the user experience.

In its gold-effect lacquered finish, the L10W looks smart, featuring a painted coarse-textile effect on its smooth lid back and genuine textured plastic underside. Powering the compact laptop is an Intel Celeron N2840 processor, a budget dual-core design designed for low-end consumer laptops. This is clocked at 2.19GHz and has a little scope to run faster, to 2.58GHz, using a what Intel calls Burst Technology, believed to be a more basic version of its Turbo Boost Technology. Supporting the processor is 4GB of 1600MHz memory - not upgradeable - and a 500GB hard-disk drive.

Toshiba has preinstalled regular Windows 8.1, a step away from the free version that Microsoft now offers to hardware partners on the condition that they don't try to earn kickback revenue from Google or other search engines by turning off Bing. But without those conditions attached to the regular Windows OEM edition, Toshiba has instead taken the opportunity to claw back its investment and turn some profit by including plenty of third-party sponsorship.

Skyscanner, Spotify, eBay, Google and Amazon are five companies that appear unbidden in Internet Explorer's favourites bar, on the Windows desktop or the main taskbar, while Intel's McAfee division wants to prise money from the hapless laptop buyer to keep using its pre-installed virus software. New IE web pages open with both MSN and link aggregator Symbaloo pages. But award for the cheekiest piece of affiliate marketing must go to Toshiba's removal of Windows' built-in free archive extraction tool, for opening .zip files. Instead, any .zip file must be opened by the commercial WinZip program that's been installed, prices starting at £22.36.



Ports and connectors are limited, but no more so than many ultraportable-class laptops today. Two USB ports are included, USB 3.0 to the left and USB 2.0 to the right. There's an HDMI output for connection to a monitor, TV or projector, and an SDXC slot for memory cards. A single 3.5mm headset jack lets you connect earphones with mic for video chats, for example. But missing from the laptop is any ethernet network port.

To get online, the L10W instead relies on its basic Wi-Fi facility, which connects to wireless networks up to 11n spec, albeit with the slowest single-channel configuration.

The display is a budget TN touchscreen with a poor contrast ratio and limited colour capability - to wit, just 80:1 and only 56 percent of the sRGB colour space. Its pixels span 1366x768, a low resolution for laptop screens but helped here by filling an 11.6in rather than 15.6in panel. Consequently, its pixel density of 135ppi is better than the latter 100ppi, meaning not such grainy screen typography. Maximum brightness of the display was a comparatively low 191cd/m².

Rectangular, not square, tiles make up an otherwise standard-issue Scrabble-tile keyboard, slightly reduced in height to fit the smaller frame of an 11.6in screen laptop.

The trackpad is a traditional buttoned design, rather than buttonless, which is more welcome on low-cost laptops since the cheapest buttonless pads rarely work well. Here though the buttons themselves are something of a struggle to operate, require concerted finger/thumb downforce

to click. In use, we noticed random pauses and slowdowns from the Toshiba, with the trackpad seemingly broken at times.


Below Intel's Core series processors lies the range now named Pentium. Below that Pentium range are the Celeron series as used in this Toshiba. Consequently expectations for good performance should not be high.

In the Geekbench 3 test of CPU and memory speed, the Toshiba scored 1069 points single-core, and 1863 points multi-core. For context, an Apple iPhone 5s from 2013 scores 1412- and 2537 points respectively in the same test. In other words, the 2.16GHz Intel Celeron markedly trails a two-year old telephone with 1GHz processor.

Gaming with modern Windows action games is not really an option with the 'Intel HD Graphics' integrated into this Celeron chip. We tried Batman: Arkham City at screen native resolution and High detail, and the game averaged just 11 frames per second. Falling back to 1280x720 and Medium detail, it rose to a still effectively useless 14fps; dropping to Low detail added one more frame per second.

In our battery life tests the Toshiba was not too terrible, lasting a minute shy of five hours (four hours, 59 minutes) in our standard looped-video rundown test over Wi-Fi.

Verdict

As a laptop, it's rather slow, while an arguably superfluous touchscreen means costs have been cut elsewhere to accommodate this divisive feature.  **Andrew Harrison**

£179 inc VAT**Contact**■ acer.co.uk**Specifications**

Android 4.4 KitKat;
10.1in LCD touchscreen,
1280x800, 149ppi;
MediaTek MT8127
processor, 1.3GHz quad-
core; 1GB RAM; 32GB
internal storage, microSD
card slot (up to 32GB);
4Mp rear camera; 1Mp
front camera; Wi-Fi
802.11b/g/n; Bluetooth 4.0;
Micro-HDMI; 21.6Wh
Lithium-ion battery;
256x171x8.9mm; 520g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**TABLET****Acer Iconia Tab 10**

You can normally rely on Acer to provide tech products with cheap price tags and the Acer Iconia Tab 10 is no exception. For a full-size tablet, the asking price of £179 is more than reasonable. It's cheaper than tablets such as the Google Nexus 9, but it does have some competition – the Kobo Arc 10HD is now under £200, while the Lenovo Yoga Tablet 10 comes in at just over the £200 mark.

It's no surprise that the design of the Iconia Tab 10 is basic and plain. The volume rocker sits on the top, while the power button and ports reside on the left side. The microSD card slot isn't covered up, which looks a little ugly.

This is a typical 10in tablet designed to be used in landscape mode and only comes in a white colour option. The back of the tablet is a silver colour that doesn't even look like imitation aluminium. The chunky bezel around the screen is unattractive but does mean you can hold the tablet without your fingers getting in the way of the display.

It's fairly thin at 8.9mm, which is good to see for a cheap tablet, but it is a hefty 520g, so despite the bezel, you won't want to hold it for too long – especially one-handed.

Powering the Iconia is a quad-core MediaTek MT8127 processor that's clocked at 1.3GHz. It has 1GB of RAM and in our tests we found performance to be slick considering the price. Calling the recent apps menu and quitting back to the homescreen is surprisingly speedy. Scrolling is smooth too, though some apps can take a little time to load.

Inside is a decent 32GB of storage to play with which is double what we'd expect for the price and around 25GB is available after the OS and pre-loaded content. There's also a microSDHC card slot for adding up to 32GB more if you wish.

As you can guess from the name, the Iconia Tab 10 offers a 10.1in screen, which has a 16:9 aspect ratio designed to be used



predominantly in landscape orientation. Even at this price point, it's disappointing that Acer has opted for a TFT panel with a WXGA resolution of 1280x800.

Don't expect good viewing angles, while a pixel density of 149ppi is nothing to get excited about, so don't anticipate a crisp image either. The screen is perfectly usable but isn't high quality.

Equally uninspiring are the front- and rear cameras, which are rated at 1- and 4Mp respectively.

Wireless connectivity is basic with 802.11b/g/n Wi-Fi and Bluetooth 4.0 but alongside the usual headphone and Micro-USB ports is a potentially handy Micro-HDMI port meaning you can connect the Iconia Tab 10 to your TV or a PC monitor easily. A cable isn't provided, though.

Battery life is important and Acer has fitted the Iconia Tab 10 with a 21.6Wh Lithium-ion battery. In our battery test, we recorded a result of eight hours, 52 minutes which is a good effort.

When it comes to software, the Iconia Tab 10 runs on Android 4.4 KitKat. Acer has confirmed it will be upgraded to version 5.0 Lollipop but has given no time frame for it.

For now, the user interface is largely stock Android – as Google intended it to be – so you get the KitKat recent apps menu and dual drop down bars (one for notifications and one for quick settings). That's a good thing in our eyes and you can, of course, customise the homescreen panels with your


favourite apps and widgets. Acer does add some content, though, including a Touch WakeApp, which enables you to launch an app of your choice or simply the homescreen with a five-finger touch of the display.

Similar to Sony, there's also something called the 'Float Gadget' which gives you a small windows including a calendar, calculator and memo pad.

Those features are handy but what we're not so impressed with is the amount of pre-loaded apps. It's a lot like the Toshiba laptop opposite. There are a number of Acer's own apps, Amazon ones plus others such as Evernote, Skype, OfficeSuite, TuneIn Radio, Zinio and McAfee Security.

It's a long list and might save you the bother of downloading an app you want anyway, but we think it's better to simply choose what you want rather than the decision being made for you. It also takes up valuable storage space and the real kick in the teeth is that most of them can't be uninstalled.

Verdict

There's little to get excited about with the Acer Iconia Tab 10 but that's fine with a price tag of £179. It's plain in appearance and heavy, but apart from a few too many pre-loaded apps, the tablet offers good performance and decent storage plus a handy Micro-HDMI port. Overall, it's a good choice if you're looking to spend under £200 on a large Android tablet.  **Chris Martin**

GEEKBENCH 3 (MULTI-CORE)**GFXBENCH (T-REX)****SUNSPIDER****Acer Iconia Tab 10**

1201

13fps

1666ms

Lenovo Yoga Tablet 10

1070

5fps

1433ms

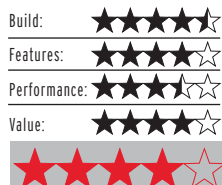
£579 inc VAT

Contact

■ htc.com/uk

Specifications

Android 5.0 Lollipop with Sense 7.0; 5in Full HD screen (1080x1920); Qualcomm Snapdragon 810 processor; 64-bit, octa-core; 3GB RAM; 32GB storage, microSD card slot (up to 128GB), 100GB Dropbox cloud storage; 20Mp rear camera; 4Mp UltraPixel front camera; dual-band 11ac Wi-Fi; NFC; Bluetooth 4.1 with aptX; Infrared transmitter; GPS; non-removable 2840mAh battery; 70x145x9.7mm; 158g



SMARTPHONE

HTC One M9

The One M9 is HTC's flagship smartphone for 2015. Similar in design to its predecessor, the M8, it's more a case of design evolution than revolution. New features include a scratch-resistant coating, machine drilled buttons and a sapphire glass lens on the rear camera. The power button is now on the side instead of the top and has a textured finish, so you can feel the difference next to the smooth volume buttons.

Colour options are similar, but HTC has employed a new two-tone look with the back and sides getting contrasting adonisation.

We were hoping for a thinner and lighter design, and although HTC tells us the device is slightly lighter than its predecessor, we weighed them both at 158g. It's also marginally thicker at 9.7mm compared to the M8's 9.6mm.

The M9 has the same Full HD 5in display, with a resolution of 1080x1920. This might seem lower grade than Quad HD devices such as the LG G3, but HTC told us that higher resolution isn't needed on a display this size and would mean a sacrifice in the battery department.

Other things that remain the same include the 32GB of internal storage and a microSD card slot capable of accepting up to 128GB cards. A 64GB model is available, but there's no news as to whether this will be released in the UK.

Wireless setup remains strong, with 11ac dual-band Wi-Fi, Bluetooth 4.0 with aptX, NFC and an IR blaster. It also supports 4G (and LTE-A) networks via the nano-SIM slot if you have the right tariff.

The One M9's memory has been increased by 50 percent to 3GB and there's a new processor in the form of Qualcomm's Snapdragon 810, which is both octa-core and 64-bit (quad-core 1.5GHz Cortex-A53 and quad-core 2GHz Cortex-A57). It comes with the Adreno 430 GPU and we can't fault the performance - see our table below.



The BoomSound front-facing stereo speakers are still a key feature, now with Dolby Audio. Once again they sound amazing and offer the best experience you'll find on a smartphone.

The One M9 no longer has the Duo Camera setup consisting of two camera lenses. Instead, HTC has opted for a 20Mp rear camera with the same dual-LED flash.

On the video side, it can record video up to 4K resolution and uses a 'dynamic exposure algorithm' to mimic the human eye. Default is Full HD, and to rival the iPhone there's a Slow motion mode that can record up to 120fps.

The One M9 has a 2840mAh battery, which in our tests lasted for a couple of days between charges. The phone comes with an Extreme power saving mode to extend its battery life. This puts the M9 into a basic mode, allowing access to a small selection of simple functions like phone and messages.

The handset runs on Android 5.0 Lollipop. HTC has, however, put its own skin or user interface over the top. The M9 introduces Sense 7.0, which means you get HTC's style including icons and apps but there are also some new features.

HTC largely does things its own way, with BlinkFeed to the left of the main homescreen, a grid view recent

apps menu and a vertically scrolling app menu. However, the stock drop-down notification bar is in use (with some HTC style added) and the good news is that you can customise which quick settings you want.

Luckily, you can tweak the way you want to use the phone, so the BlinkFeed panel can be removed. You can opt for the stock Lollipop card system for recent apps, and although you can't make the app menu scroll horizontally, you rearrange around, hide them and adjust the grid size.

Customisation is the main emphasis of Sense 7.0, so there's a new Themes app that allows you to download various user interface themes. You can, however, edit the details yourself such as icon styles and fonts. The software will also generate a theme for you based on a photo.

Motion Launch Gestures are still part of Sense and mean you can do handy things such as double-tap the screen to turn it on and off. Up, down, left and right swipes will unlock, turn on voice dialling, launch the widget panel and open BlinkFeed respectively - all with the screen off.

Verdict

The One M9 is a desirable phone with the best design and build in Android land. **Chris Martin**

	GEEKBENCH 3	GFXBENCH (T-REX)	GFXBENCH MANHATTAN	SUNSPIDER
HTC One M9	3778	50fps	24fps	867ms
HTC One M8	2761	30fps	12fps	583ms
iPhone 6	2794	49fps	26fps	351ms

£650 inc VAT**Contact**■ samsung.com/uk**Specifications**

Android 4.4.4 KitKat OS;
5.6in (1600x2560)
Super AMOLED display
with edge screen; 2.7GHz
Quad-Core Qualcomm
Snapdragon 805 CPU;
Adreno 420 GPU; 3GB
RAM; 32/64GB internal
storage; 16Mp rear
camera laser AF with
optical image
stabilisation; 3.7Mp front
camera; video recording
at up to 4K; Wi-Fi
802.11a/b/g/n/ac;
Bluetooth 4.1 LE; NFC;
infrared; fingerprint
scanner; heart rate
monitor; UV sensor;
A-GPS; 4G LTE (Cat
6); Micro-SIM;
11.1Wh (3000mAh)
removable battery;
82x152x8.3mm; 174g

Build: ★★★★★☆

Features: ★★★★★★

Performance: ★★★★★☆

Value: ★★★★★☆

**SMARTPHONE****Samsung Galaxy Note Edge**

With its innovative and unique curved screen, it's no surprise that the Galaxy Note Edge fetches a high price. But is it worth £650?

Despite its new breed of display tech, the Note Edge is thinner and lighter than the similarly-sized Galaxy Note 4 – although only by a tiny margin. The device is 8.3mm thick and 174g, but it feels a lot lighter than it is.

Samsung has stuck with the textured faux leather effect rear cover that provides good grip but may not be to everyone's taste in terms of looks. Although the rear cover is the typical thin plastic that we're accustomed to on Samsung phones, there is some proper metal running around the edge. This not only looks good but provides strength – it's a shame that most of it is covered with white paint leaving just a shiny bevelled edge.

If you're after colours, you'll have to look to the Note 4 as the Note Edge comes only in black or white. Because of the curved right-hand edge, the power button is on the top of the phone.

The 'next generation display' is this handset's unique selling point. It's hard to explain in words, so we highly recommend watching our video review at tinyurl.com/obfjham. The display curves around towards the back of the phone on one side, almost giving you another dimension.

The screen itself, ignoring the curved section for a moment, is in essence the same as the Note 4's. It's got a Quad HD (1600x2560) resolution, and uses Samsung's Super AMOLED technology.

The curved section is easy to use, and looks good from most angles. With customisation, it can show various information, such as the time and weather or football scores. There are also app icons, which free up space on the main display, and it's easy to scroll through the panels you've chosen.

In terms of hardware, the Galaxy Edge offers much the same as the Galaxy Note 4. Inside is a 2.7GHz processor and there's 3GB of RAM, which is a healthy amount.

As you can see in our table, it performs on a similar level to the Note 4 across the board, and although it outpaces the iPhone 6 Plus in Geekbench 3, it lags behind on graphics and web browsing. The former is mainly down to the higher resolution.

Although the raw numbers are largely impressive, the Note Edge isn't the most responsive phone from a user perspective. It's smooth most of the time, but occasionally lags when switching between apps and quitting back to the home screen which is not what we expect from a phone of this calibre.

Two storage options are on offer: 32- and 64GB. A microSD card slot will take this up to 64GB cards.

Samsung likes to add lots of gadgetry to its devices and the Galaxy Note Edge is no exception. There's a fingerprint scanner (still the awkward swipe gesture) and a heart rate monitor. It also has 4G LTE (Cat 6) support, an IR blaster, NFC, 11ac Wi-Fi, GPS, Bluetooth 4.1 and MHL 3.0.

Battery life is a letdown, though. During testing, we found it will last only one day. The screen consumes a lot of power, so every time it's turned on the battery percentage drops. Of course, it does have the potential to last longer but only if left on standby or if you use Samsung's Ultra Power saving mode.



Photographers will be pleased that it has a 16Mp rear camera with optical image stabilisation (OIS). There's the usual array of Samsung camera modes, including HDR and selective focus. The front camera is a respectable 3.7Mp with f1.9 for all those selfies. Performance is good as you would expect from a premium Samsung smartphone and you can also record video in up to 4K resolution.

The Note Edge runs Android 4.4.4 KitKat, with Samsung's TouchWiz interface over the top. It's better than previous versions with a slicker style and the Flipboard, which is a swipe away from the home screen is optional.

Finally, the Note Edge comes with Samsung's S Pen stylus. This now has a new sensitivity level of 2048 and the ability to be used like a computer mouse (for example, highlighting text).

Verdict

The Samsung Galaxy Note Edge is a big and expensive device, so it might be worth waiting for the next generation before taking the plunge. **Chris Martin**

	GEEKBENCH 3	GFXBENCH (T-REX)	GFXBENCH MANHATTAN	SUNSPIDER
Galaxy Note Edge	3331	25fps	10fps	1116ms
Galaxy Note 4	3272	27fps	11fps	1367ms
iPhone 6 Plus	2917	41fps	19fps	369ms

£49 inc VAT

Contact

■ microsoft.com/en-gb

Specifications

1.2GHz Qualcomm Snapdragon 200 dual-core processor; Windows Phone 8.1 with Lumia Denim; Micro-SIM, supports 850/900/1800/1900MHz GSM, 900/2100MHz WCDMA; 1GB RAM; 8GB storage (plus microSD support up to 128GB and 30GB cloud storage); 4in (800x480, 233ppi) LCD capacitive touchscreen; 802.11b/g/n Wi-Fi; Wi-Fi hotspot; Bluetooth 4.0; A-GPS; GLONASS; 2Mp, f2.7 fixed-focus rear camera, WVGA (800x448) video recording at 30fps; 0.3Mp (VGA) f2.7 front camera, VGA (640x480) video recording; 3.5mm audio jack; 1560mAh removable battery; 64.7x11.7x118.1mm; 134.1g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★



SMARTPHONE

Microsoft Lumia 435

The Lumia 435 is a dirt-cheap smartphone. It's not aimed at phone enthusiasts but light users or those who are looking to buy their first smartphone.

What's really interesting about this cheap Windows Phone is that Microsoft has confirmed it will run Windows 10 when it arrives later this year. The Lumia 435 will then be your cheapest entry point to a full Windows 10 computer. Compare that to budget Androids, which are unlikely to ever be upgraded from the KitKat or Jelly Bean operating systems they ship with.

Even now, with its Windows Phone 8.1 software, one thing we've always admired about Windows Phone is how well it runs on lower-spec hardware, making it a fantastic candidate for a cheap smartphone such as the Lumia 435. So we're a little dumbfounded to find a better hardware specification here than in any sub-£50 Android phone (sub-£50 iPhones simply don't exist).

Short and squat, the Microsoft Lumia 435 is exactly what you'd expect from a budget smartphone. It's pretty chunky at 11.7mm, but rounded edges at the rear and a 4in screen make it comfortable to use in a single hand. We like the 134g weight, too, which stops this cheap phone feeling like a toy.

It's made from plastic, but unlike many of the black plastic Android slabs you'll find at this price its bright and colourful rear extends to the front for a splash of colour. In this sense Microsoft (okay, Nokia) has also found a great way of getting around the creakiness associated with removable rear panels, although it does mean the screen juts out somewhat at the front. These covers are interchangeable (but sold separately), giving access to an also-removable battery, Micro-SIM and microSD card slots.

The screen is a 4in LCD with an 800x480-pixel resolution, which has a pixel density of 233ppi. This is pretty standard for a budget smartphone and, although the bright and colourful Windows Phone tiled interface looks infinitely better on an HD screen, even here it's attractive. We weren't very keen on our sample's sickly green colour scheme out of the box, with that colour to

our eyes looking more obviously washed out than any other, but on changing the theme to crimson Windows Phone was back to looking beautiful.

Sat beside a full-HD screen the difference is notable, but after a few minutes of playing with the Lumia 435 you quickly become used to the screen quality. That hint of fuzziness won't disappear, but watching videos and browsing photos on this sub-HD screen is not about to hurt your eyes either. For the money, the screen quality is absolutely acceptable, plus, it has good viewing angles and doesn't feel overly dim.

You'd be forgiven for thinking the Lumia 435 has the same core hardware specs as the £89 Lumia 535, with both featuring a 1.2GHz Qualcomm Snapdragon 200 chip, 1GB of RAM and 8GB of storage – the latter two are extraordinary at this price, and double what you'll find in any £50 Android phone. In fact, the processor inside this Windows Phone is a dual-core model, whereas the 535 has a quad-core chip. The 1GB of RAM will be important if you decide to upgrade to Windows 10.

General performance is acceptable. Launching apps and moving between menus is by no means instantaneous, but it's fluid enough. One thing we did notice is that the camera still takes a good six or seven seconds to launch, despite this phone running Lumia Denim, which promises faster camera startup and photo capture.

In addition to the 8GB of internal storage, the Lumia 435 has a microSD card slot that supports up to 128GB. You also get 30GB of free cloud storage via the built-in OneDrive app.

Connectivity-wise you get 802.11b/g/n Wi-Fi and Wi-Fi hotspot, Bluetooth 4.0, A-GPS and GLONASS. The Microsoft Lumia 435 accepts a Micro-SIM and operates on 2G- and 3G networks, but it does not support 4G. That's not a surprise – you'll have to pay at least £100 if you want



4G connectivity. A dual-SIM version is also sold outside the UK.

Although Windows Phone is often criticised for its lack of apps, a handful of those built into Windows Phone is one of the things that endears us to the OS. Through its HERE Drive suite you get free turn-by-turn driving instructions, offline maps and live traffic information, meaning this £50 smartphone can double as your satnav.

We can't forget Cortana either, Microsoft's voice assistant that is just as capable as Google Now and Siri – you can ask it anything. And we love the Lumia 435's double-tap-to-wake feature.

Photography is one area in which the Lumia 435 shows its budget roots, with just a 2Mp fixed-focus camera at the rear. As we mentioned earlier, it takes a while to start up, and there's no LED flash so you can forget about shooting in low light (or using this phone as a torch).

Something that also gives the Lumia 435 an advantage over its cheap smartphone rivals is a front-facing camera. Sure, it's just 0.3Mp, fuzzy and horrible to look at, but it opens up a new world of video chat (and unrecognisable selfies) that just isn't possible with cheap Androids.

Microsoft has fitted the Lumia 435 with a 1560mAh removable battery. In our experience this is a one-day battery – it might not sound especially high in capacity, but this phone doesn't run particularly demanding hardware.

Verdict

This is the best phone you can buy under £50. Marie Brewis

£109 inc VAT**Contact**■ motorola.co.uk**Specifications**

Android 5.0 Lollipop (with guaranteed upgrade to the next version of Android); 4G LTE bands 1/3/7/20, 3G 900/2100MHz, 2G 850/900/1800/1900MHz; 4.5in qHD (540x960, 245ppi) IPS display, with Gorilla Glass 3 and anti-smudge, splashproof coating; 1.2GHz Qualcomm Snapdragon 410 quad-core processor; 400MHz Adreno 306 GPU; 1GB of RAM; 8GB of storage, expandable through microSD up to 32GB; 802.11b/g/n Wi-Fi; Bluetooth 4.0 LTE, GPS; 5mp rear- and VGA front cameras, 720p video at 30fps; 2390mAh battery; 66.8x52-12.3x129.9mm; 145g

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★★

**SMARTPHONE****Motorola Moto E**

Thanks to some useful hardware upgrades, the Moto E is no longer just a cheap phone for first-time or light users, but a proper Android smartphone that is more than capable enough for day-to-day use.

The Moto G, the Moto E's bigger brother, has had a bit of an odd history, first sold as a 3G phone (mk 1), then upgraded to 4G (mk 2), and then a second version was released without 4G (mk 3). Motorola has since told us it would never again sell a (new) 4G version of the Motorola Moto G in the UK, which is odd, given it's just added 4G connectivity to the entry-level model in the line-up. So ignoring the fact the mk 2 Moto G, which comes with 4G, is now over a year old, is there any reason why you might choose to buy the Moto G 4G over the Moto E 4G? In a word: no.

When placed side-by-side the difference in size and weight is barely noticeable (the Moto G 4G is just 2g lighter and only 0.7mm thinner). The new Moto E 4G has a newer processor, faster graphics and a larger-capacity battery. Meanwhile, the Moto G 4G has a slightly higher-resolution still-4.5in screen at 1280x720 (326ppi vs the 245ppi of the new Moto E), and an LED flash at the rear.

The Moto E 4G is very similar in its design to the original Moto E, with the same curved rear, chunky design that feels good in the hand, and reasonably thin screen bezel. It's lost one of the two metal bars at the front, now with just the one at the top to hide the speaker. For a budget phone, it looks pretty good.

A key difference is the larger screen. Now a Kestrel-matching 4.5in rather than the 4.3in we saw in the original Moto E, the Motorola offers slightly more screen space on which to watch videos and play games. The resolution hasn't changed, though, meaning this qHD (540x960) IPS display has a lower pixel density of 245- rather than 256ppi.

The display itself is good for the price, bright and reasonably clear for a qHD screen. IPS tech means colours are true and viewing angles are good. The Moto E's screen is now splashproof; it also has an anti-smudge coating and is protected with Gorilla Glass 3.



Despite the increase in screen size, the Moto E is just 3g heavier than the original. The reassuringly heavy 145g smartphone is the same width at 12.3mm, which is a tell-tale sign of its budget price, and just a little longer and wider at 66.8x129.9mm.

The new Moto E features several hardware upgrades. It still has a 1.2GHz Qualcomm Snapdragon chip, but the 410 chip seen here is quad-rather than dual-core. Memory is the same, at 1GB, while storage has doubled to 8GB. As before you can add up to 32GB via microSD. And where the original featured the Adreno 302 GPU, this has the 306.

In use, the phone feels pretty swift in general, but there can be annoying delays when opening apps. There's also slight hesitancy when navigating around Lollipop, but nothing you won't get used to.

One of the additions to the new Moto E is a front-facing camera. It's only a VGA model, and not much cop for selfies (although you can set a timer), but those looking to Skype or video chat through other means will appreciate its presence.

As before, the rear camera is 5Mp, here with a f2.2 aperture, 4x digital zoom and several features such as a burst mode, auto HDR, tap to focus and quick capture. HD (720p) video is supported at 30fps, and there's also a slo-mo video mode. There's no LED flash, which is not at all unusual for a budget phone, but it's a pain if you were hoping to use your phone as a torch. The results are very much the same

**PC ADVISOR**
RECOMMENDED

as we saw from the original Moto E. Images are generally well exposed, but lack detail and reveal heavy-handed compression when you zoom in and look closely. They're fine for sharing online, but won't produce good enlargements for printing to put on the wall.

Video is understandably shaky since there's no stabilisation. However, it is captured in HD now: 1280x720 as opposed to the 854x480 of the old Moto E.

The key change in the new Moto E is that for an extra £20 over the original it includes 4G connectivity, operating on LTE bands 1, 3, 7 and 20. Other connectivity specs remain unchanged, and the new Moto E 4G features Bluetooth 4.0 LE, 802.11b/g/n Wi-Fi and GPS.

Whereas the original model ran Android KitKat, the new Moto E has Lollipop version 5.0 out of the box. It's a reasonably plain implementation of Lollipop, but with some unique Moto software features. It can show notifications without waking the screen, and monitor your activity to create useful new features and functions.

Motorola has also upgraded the Moto E's battery. Whereas before it was fitted with a 1980mAh battery it now has 2390mAh. This should be enough for a full day's use.

Verdict

The new Moto E 4G is a worthy upgrade over the original Moto E, with upgrades in every area. It's the best budget 4G phone intended for UK sale we've seen. **Marie Brewis**

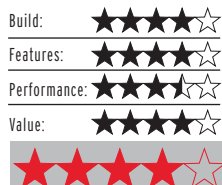
£199 inc VAT

Contact

■ huawei.com/uk

Specifications

5.5in (1280x720 pixels, 245ppi) HD720 display; Qualcomm Snapdragon 410; 1.2GHz, quad-core, 64-bit; 16GB storage + microSD for up to 128GB; 2GB RAM; 4G LTE; 13Mp rear camera; 5Mp front camera; 1080p video recording Bluetooth 4.0; Wi-Fi (802.11n); 3000mAh removable battery; 154x77x7.6mm; 165g



SMARTPHONE

Huawei Ascend G7

Huawei launched the Ascend G7 back at IFA in September 2014, but it's only just arrived in the UK (it was originally supposed to go on sale in November). It's a 5.5in mid-range smartphone with a metal chassis and - on paper - decent specifications for a sub-£200 phone.

Thanks to its aluminium chassis and chamfered edges - those so beloved of Jony Ive - the Ascend G7 looks like a more expensive smartphone than it is.

The back and sides are metal, with a slightly curved shape to the back that feels comfortable in the hand. There are iPhone 5-like plastic inserts at the top and bottom and the Apple compliments continue with Huawei's colour naming: the G7 comes in Horizon Gold, Moonlight Silver and - get this - Space Grey.

We prefer the white and silver model over the black and grey option, whose plastic sections make it look like a cheaper phone. However, the front-mounted sensor and camera are almost invisible on the grey model and their asymmetrical locations on the white model are slightly annoying.

Huawei has also kept the bezels around the 5.5in display nice and thin, as well as the actual thickness of the phone itself, at just 7.6mm - the same as the iPhone 5s. It weighs 165g, though, which is heavier than you'd expect, but gives it a reassuring heft. You even get a thin plastic shell-style case in the box.

The 5.5in IPS display found on the Huawei Ascend G7 has a resolution of 1280x720, giving it a pixel density of 267ppi. That's a bit disappointing when compared with some of its rivals such as the Nexus 5's 445ppi, and even the cheaper, second-generation Motorola Moto G, which has a 293ppi display. And although totally out of the G7's league, the LG G3 and iPhone 6 Plus also have much higher resolution 5.5in displays.

However, it's a bright, decent quality IPS screen, and we'd rather compromise on the resolution than the actual quality of the screen, so it's an acceptable trade-off here. The large display is ideal for TV and YouTube videos, though.

Inside the Ascend G7 is a quad-core 1.2GHz processor, which is not

particularly powerful for a mid-range smartphone but it's 64-bit ready for Android Lollipop - if Huawei chooses to offer the update. Handily there's 2GB RAM to work with: many close rivals only offer 1GB, and this isn't really enough for 64-bit Lollipop.

The bad news is that KitKat doesn't run all that smoothly on the G7. We saw some lag and stutter when navigating around Android, using the task switcher, camera and other apps.

We thought it was down to Huawei's own launcher, but it still wasn't perfect after installing the Google Now launcher.

In our benchmarks we saw some relatively unimpressive scores. Geekbench 3, for example, returned results of 482 (single-core) and 1448 (multi-core). Those are almost identical to the HTC Desire 820: not surprising given both phones have the same Snapdragon 410 CPU.

Forget playing the most demanding games at their highest quality settings: the Ascend G7 could muster only 1.8fps in Manhattan and 4fps in the T-Rex tests within GFXbench.

There's 16GB of internal storage with a microSD slot, but you'll only be able to add an additional 32GB which might not be quite enough for some people.

When it comes to connectivity, you'll find 4G, 802.11n Wi-Fi, GPS and Bluetooth 4.0. There's also NFC and a built-in FM radio.

Huawei says that the Ascend G7's 3000mAh battery will last up to "1.2 days of power on a single charge" with heavy use. There's an ultra power saving mode, which should mean an extra 24 hours of battery even if you've got just 10 percent of charge remaining.

On to cameras now, and Huawei has given the Ascend G7 some impressive snappers for the price. It has a 13Mp rear camera with an aperture of f/2.0 and an LED flash, and on the front is a 5Mp camera that selfie fans will appreciate.

They're paired with some software features including HDR,



quick capture, the ability to capture panoramas using the front-facing camera for some 'groufies', and some facial-enhancement capabilities that Huawei calls beauty mode. There's also a nifty 'all-focus' shooting mode that lets you take a photo and then choose what you want in focus later. It works, too.

The rear-facing camera is capable of recording video at 1080p. It isn't stabilised, but detail and sharpness levels are good for the price.

As we've seen already with previous Huawei phones, the G7 comes with Emotion UI over the top of Android KitKat (there's no word of a Lollipop update).

EMUI, as it's called, makes it look like the G7 is running Lollipop by changing the three icons at the bottom of the screen. It's very customisable with a nice selection of themes, but all the icons look a bit dated and twee.

There's a lot of preinstalled bloatware such as the Bitcasa and Highlights app, while others may or may not appeal, such as the mirror and magnifier apps which use the front- and rear-facing cameras.

Verdict

If you're after a large-screen 4G phone and you want Android, the Ascend G7 fits the bill. Jim Martin

£99 inc VAT**Contact**■ hihonor.com**Specifications**

Android 4.4.2 KitKat OS;
5in (720x1280, 294ppi) IPS
display; MediaTek 1.3GHz
quad-core Cortex A-7
processor; Mali-400 MP2;
1GB RAM; 16GB internal
storage; microSD up to
32GB; 8Mp rear camera,
with LED Flash; 2Mp
front camera; Wi-Fi
802.11b/g/n; Bluetooth
4.0; A-GPS; Micro-USB;
dual-SIM (micro);
2000mAh battery;
72x142x9.4mm; 156g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**SMARTPHONE****Honor Holly**

After the impressive Honor 6 and not so great 3C, the firm backed by Huawei is bringing another existing smartphone to the UK.

There's really not much to say about the design. This thing is about as close as you can get to a bog standard 'candy bar' smartphone. We're not saying it looks bad, but it doesn't exactly look exciting or stylish either. It just looks like a generic phone. In fact, it looks like a rounded version of Honor's own 3C.

The Holly is one of the biggest budget phones we've seen, partly because it has a 5in screen, but also due to its chunky bezels. The back, home and menu buttons are off-screen, which is now unusual for an Android phone, and the menu has been replaced with recent apps.

A curved rear cover feels good in the hand, though, we're not particularly keen on the shiny plastic. The cover comes off, so you can access the battery, dual-SIM slots and microSD cards slot.

This handset is neither thin nor light at 9.4mm and 156g. This is understandable considering the budget price tag, but not compared to rivals including the Moto E and EE Kestrel which are far more desirable.

The 5in screen is a good size and has a good HD 720p resolution. Many go for qHD instead, so a pixel density of 294ppi is a good result, and the display is IPS so viewing angles are good. Brightness is also decent if you feel the need to crank things up but it's not all good news.

The display is set back from the screen a little, which feels odd. You'll get used to it, but there's a bigger problem. The glass front attracts grease and quickly gets smeared creating a very distracting moiré effect. It's a bit like a digital oil slick of blue, red and green pixels, which is most noticeable when the screen is white so normally when browsing the web.

Inside is the same MediaTek 1.3GHz quad-core processor and

Mali-400MP2 GPU found in the 3C. However, its 1GB of RAM is half that of its sibling. There's no surprise that it benchmarked similar but strangely outpaced its sibling in the SunSpider web browsing test where lower is better. We think this is down to the 3C running older Android 4.2 Jelly Bean, while the Holly is on 4.4 KitKat.

From a user perspective, performance is good - better than you might expect for a phone this cheap. It's by no means slick but you can play games like Temple Run 2 with no major issues and web browsing is smoother than we thought it would be. There is the occasional delay when launching apps and the like but it's almost on a par with the Moto G.

Although the Holly has less RAM than the 3C, it bizarrely has more internal storage. It offers twice as much, in fact, at 16GB and there's still a microSD card slot for adding up to 32GB more should you need it.

The Honor Holly has dual-SIM slots so you can use two different cards at the same time. You can still just use one but it makes the phone a cheap option for anyone looking for a handset with this feature.

You get basic 802.11b/g/n Wi-Fi, Bluetooth 4.0 and A-GPS. Importantly there is no 4G support so you'll need to look elsewhere if this is a must.

The removable battery is 2000mAh. Although this isn't big, we found the Holly lasted well and will easily get you through a day or more as long as you don't go too hard on it with video and gaming.

At 8Mp, the rear camera on the Honor Holly sounds impressive - that's the same resolution as the iPhone 6. However, it's not as simple as that. It can't match up to premium phones, though, the results are pretty good. There's an HDR mode and we found the Holly could take photos quickly although the auto focus does struggle a



fair amount. An LED flash is a nice addition for a budget phone and video can be recorded at Full HD.

At the front is a 2Mp camera which is lower resolution than the 3C's impressive 5Mp selfie cam but it offers a good amount of detail.

The Holly runs Android 4.4.2 KitKat, which isn't the latest version but this isn't a brand-new phone - just to the UK. The firm uses Huawei's Emotion UI 2.3 and although the Honor 6 has been updated to version 3.0,

The user interface is lightweight, using the stock notification bar and quick settings. However, there are a number of areas where we're not so impressed. For starters, you must swipe down to unlock the Holly which is unnatural compared to other user interfaces.

The Emotion UI also ditches the traditional app menu, so all your icons must be stored on the homescreen panels like iOS.

Verdict

The Honor Holly might not look stylish and have brick-like proportions but it does offer a large HD screen, dual-SIM slots, expandable storage and good battery life. **Chris Martin**

GEEKBENCH 3**GFXBENCH****SUNSPIDER****Honor Holly**

1175

7fps

1459ms

Honor 3C

1201

7fps

1904ms

Motorola Moto E

608

11fps

1877ms

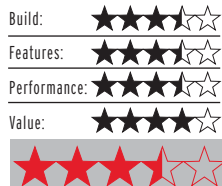
£209 inc VAT

Contact

■ htc.com/uk

Specifications

5in (720x1280, 293ppi) IPS display; Qualcomm Snapdragon 410, 1.2GHz; quad-core, 64-bit; 8GB storage + microSD for up to 128GB; 1GB RAM; 4G LTE; 8Mp rear camera; 5Mp front camera; 1080p video recording; Bluetooth 4.0; Wi-Fi; 2100mAh removable battery; 150.1x72.7x9.6mm; 160g



SMARTPHONE

HTC Desire 620

HTC's new Desire 620 follows on from its 2014 Desire 610, with a bigger and better screen, a better processor, a new design and improved camera offerings. Readily available for £170, it's a mid-range smartphone that competes with the likes of the higher priced Nexus 5 but also the just-about-budget Motorola Moto G 2014.

When we first saw the HTC Desire 620 we were impressed. Our review sample was the Tuxedo Gray model and looked stylish and sleek, but there are also white models available too, some with coloured accents around in blue or red.

The back is removable, so you can access the battery, SIM and microSD card slot. It also has a matt coating, which unfortunately picks up greasy fingerprints in an instant, so you'll find yourself regularly cleaning it to keep it looking nice.

Another downfall to the design is the large bezels. The screen is 5in, but the overall size of the smartphone is much bigger. This does allow room for the front-facing speakers that we love on HTC phones, though.

Its dimensions are 72.7x150.1mm, which is significantly bigger than the 69.2x137.8mm of the Nexus 5, for example. It's also 9.6mm thick, which is a bit on the chunky side, and weighs in at 160g.

The 5in display has a resolution of 720x1280 pixels, which equates to 294ppi. That's not the best screen we've seen, but it's not the worst either. We found the colours to be bright and crisp enough to satisfy the eye, but the viewing angles are poor.

Inside the HTC Desire 620 is a Snapdragon 410 Qualcomm processor clocked at 1.2GHz and paired with 1GB RAM. This combination doesn't make for a particularly speedy or powerful device, but we didn't find the smartphone to be too sluggish.

Playing graphics-heavy games and running lots of power-hungry apps could get frustrating, but for general use including casual gaming, browsing the web, messaging, emails and social media, it's fine.

To give you a better idea of how the HTC Desire 620 compares with rivals, we ran a series of benchmark



tests to determine the processor and graphics performance, as well as a browser speed test.

In Geekbench 3.0, the HTC scored an average of 1456 in the multi-core test. That's better than the 1144 scored by the 2014 Motorola Moto G, but significantly less than the 2800 scored by the Google Nexus 5.

The Desire 620 scored poorly in the GFXBench graphics test, managing just 3.9fps (frames per second) in the Manhattan test and 9.3fps in the T-Rex test. The Nexus 5 recorded 24fps in the T-Rex test so is much faster, while the Moto G scored 11fps which was still slightly better than HTC's new offering.

Finally, in the SunSpider test, the HTC managed 1381ms, so is better than the 1526ms scored by the Moto G (lower is better in this case), though the Nexus 5 scored a much better 801ms.

There's a microSD card slot that allows you to add up to 128GB more storage space to the 8GB that's built-in to the device.

Connectivity includes 4G LTE, NFC, Bluetooth 4.0 and Wi-Fi, but not the faster 11ac standard. There are also dual-SIM models available.

HTC has given the Desire 620 an 8Mp rear-facing camera, which we found allows you to capture good but sometimes slightly grainy photographs if the conditions are right. It doesn't have great speed, so taking photos of small children could be a challenge. There is an anti-shake mode that can help, though.

The camera app itself is good, with settings that allow you to alter the ISO for better low-light photos, the white balance, the photo mode (including Macro, HDR, Night Time Portrait, Landscape, and a Panorama mode), and there are filters and effects, too. There's also an LED flash.

For selfie-lovers, the front-facing camera is good too. It's 5Mp, and there's a handy timer mode.

Both cameras are capable of capturing 1080p video, which we also found to be satisfactory though not outstanding.

When it comes to software, the HTC Desire 620 runs Android 4.4.4 KitKat, with no sign of a 5.0 Lollipop update just yet but one could arrive in the future. That's overlaid with HTC's Sense 6 UI, which we've grown to really enjoy using.

Features such as BlinkFeed give the phone a modern, youthful vibe, offering an overview of what people are talking about on social media, in the news and more. There's a Kid Mode, and Zoe, which is a photo- and video-based social app. It's easy on the eyes and simple to navigate, too.

Verdict

The HTC Desire 620 is a good mid-range smartphone that is well-priced if you find it for £170. That's around £20 more than the Moto G, but you'll get front-facing speakers, a better front-facing camera, a slightly speedier processor and 4G LTE for that extra cash. **✉ Ashleigh Allsopp**

£169 inc VAT**Contact**■ www.zte.com.cn/en/**Specifications**

5in (720x1280, 294ppi) IPS touchscreen; Android 5.0 Lollipop with MiFavor 3.0 UI; 1.5GHz Qualcomm Snapdragon 615 64-bit octa-core (quad-core 1.7GHz Cortex-A53, quad-core 1GHz Cortex-A53) processor; Adreno 405 graphics; 2GB RAM; 16GB storage (plus microSD support up to 32GB); 4G LTE 1800/2600/900/700MHz; dual-SIM; dual-band 802.11b/g/n Wi-Fi; Bluetooth 4.0; A-GPS; 13Mp Sony Exmor IMX214 rear camera, f/2.0 aperture, 28mm wide-angle lens, LED flash, 1080p video at 30fps; 5Mp front cameras; FM radio; 2400mAh battery; 144x70.7x7.7mm; 129g

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆

**SMARTPHONE****ZTE Blade S6**

The name might lead you to expect the Blade S6 to be a copy of the Samsung Galaxy S6, but it's much more similar to the iPhone 6 in design. The clean white front with circular home button, rounded corners and curved screen edges is certainly reminiscent of Apple's flagship smartphone. Even the SIM and microSD slots are very iPhone-like, not that there's much scope for differentiating there. And the MiFavor UI's lack of an app tray is just Apple all over.

For a budget- to mid-range phone the ZTE is good-looking, at least from the front, with its slim bezels and slick design. But this unibody phone is built from a slippery white and silver plastic, and compared with the iPhone 6 has a larger, lower-resolution 5in screen and slightly bigger and chunkier - but still commendably thin for the price - 7.7mm chassis. The weight is identical though, with both phones coming in at 129g.

The home button might be circular, but as soon as you put the phone on charge or get a new notification, it glows a cool blue. That constant glow can be irritating when charging the phone overnight, and you should note there's no fingerprint sensor built into this button either. On either side sit touch-operated Back and Multitasking keys, and you can switch these around if you'd rather have the Back button on the right than the default left.

That 5in screen is a usefully bright IPS panel, which offers realistic colours and excellent viewing angles. It might have only an HD (720x1280) resolution, but its 293ppi pixel density isn't far behind the 326ppi of the iPhone 6, and it's quite acceptable for the price.

A small speaker is found on the rear. If you're left-handed or place the phone screen-up you'll find it easy to muffle, but it otherwise does an acceptable job. There's also a headphone jack up top, which lets you take advantage of the Blade's FM radio.

Equipped with a 1.5GHz Qualcomm Snapdragon 615 64-bit octa-core (quad-core 1.7GHz Cortex-A53, quad-core 1GHz Cortex-A53) processor, Adreno 405

graphics and 2GB of RAM, performance is very decent for a mid-range phone. The ZTE Blade S6 also feels nippy in operation, with no sign of lag when launching apps or moving between home screens and menus. In real-life use we couldn't fault it.

In terms of storage the ZTE Blade S6 has 16GB built in, and it has microSD support up to 32GB. That will be plenty for most users, although you can also make use of cloud storage with Google's own- and third-party apps.

Not only is this ZTE Blade S6 a 4G LTE phone, but it supports dual SIMs as standard (both Nano-SIMs). Note, though, that the data connection is accessible by the first SIM only on this dual-SIM model. For more information on what this means read our dual-SIM phones feature on page 100.

As with all phones, you should check the Blade S6 will work with your network, which we understand may be an issue in the US. ZTE lists support for GSM 850/900/1800/1900MHz, UMTS 850/900/2100MHz, and 4G LTE 1800/2600/900/700MHz.

The Blade S6 also supports dual-band Wi-Fi, Bluetooth 4.0 and A-GPS. There's no NFC, but Alive Share software lets you transfer files and play multiplayer games with nearby compatible handsets.

At the ZTE's rear is a 13Mp Sony Exmor IMX214 camera with a 28mm wide-angle lens and f/2.0 aperture that can shoot full-HD (1080p) video at 30fps. We were impressed with the quality of the images it took. Colours were realistic and detail is sharp, although the LED flash does little to help grainy low-light photos, though we found video can be rather jerky as you move the camera.

The standard Camera app is basic in its Simple mode, with the usual Auto, HDR, Panorama, Beautify and Smile modes. You can also straighten images, remove moving items from view and take group photos in which you can pick

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the best image for each person in shot. Switch to expert mode and you lose these presets, but you'll get more control over your image in terms of exposure, ISO metering and white balance.

After you've taken a photo you can edit the image to add filters, borders, decorations, doodles and text, and blur parts of the picture.

At the front is a 5Mp selfie camera with f2.2 aperture. The resolution is good, but while there are Beauty and Smile shot modes there is no real-time preview or ability to adjust the effect.

The Blade S6 is one of the first non-Nexus devices to come with Android Lollipop out of the box. With cheap phones often left behind as new Android updates are released, that's fantastic news.

Over the top of Lollipop is the MiFavor 3.0 UI. The most noticeable difference over standard Android is that it removes the app tray, and with all app shortcuts displayed on the home screen, it offers a very iOS-like experience. We're not keen on the approach, but you can use folders to minimise the clutter. MiFavor also provides a number of themes and customisation options.

ZTE fits a 2400mAh non-removable battery to the Blade S6, which you'll need to charge every day.

Verdict

The ZTE Blade S6 is a great-value Android Lollipop phone with strong performance and an attractive iPhone 6-like build. **✉ Marie Brewis**

£208 inc VAT

Contact

■ elephone.hk

Specifications

5in full-HD (1920x1080, 440ppi) display;
850/900/1800/1900MHz 2G,
900/1900/2100MHz 3G;
Android 4.4.2 KitKat; 1.7GHz
MediaTek MT6592 octa-
core processor; 2GB RAM;
16GB storage (plus microSD
support up to 64GB); Mali-
450 graphics; 802.11b/g/n
Wi-Fi; Bluetooth 4.0; OTG;
dual-SIM; NFC; GPS;
fingerprint scanner; 16Mp
rear camera with LED
flash; 8Mp front camera;
6350mAh battery;
146x73.6x9.3mm;
206g (with battery)

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



SMARTPHONE

Elephone P5000

Elephone is not a brand we've come across in the UK before. This is a grey-market phone shipped to us from Coolicool.com. For further details on grey market tech see our feature on page 96.

Given that massive 5350mAh battery, we were expecting the Elephone P5000 to be very big and bulky. And clearly it is heavier and chunkier than rival 5in-screen smartphones, but at 206g and 9.3mm nowhere near as much as you might imagine.

In design, the P5000 looks exactly like a Samsung Galaxy device, and it even has a fingerprint sensor built into the Home button. Available in black or white with a silver-painted trim, this Android KitKat-powered slab feels sturdy and unbreakable, despite its removable plastic rear panel.

You'll find a Micro-USB charging port and headphone jack at the top, power and volume on the right side, and dual speakers at the bottom. A 16Mp camera with LED flash sits at the back, but there's no dedicated camera button.

A 5in full-HD IPS screen adorns the P5000, with a pixel density of 440ppi. We found it a little odd looking at an IPS screen on what felt like a Samsung phone, more used to seeing Samsung's favoured Super AMOLED in such a scenario. The display is clear and with excellent viewing angles and true-to-life colours.

Don't be fooled by the fact this smartphone has an octa-core processor; the 1.7GHz MediaTek MT6592 when paired with 2GB of RAM and Mali-450 graphics offered mid-range performance in our benchmarks. We also found the top half of the phone could become warm in use, even when all we were doing was using the camera.

The Elephone is fitted with 16GB of storage as standard, plus you can add a microSD card up to 64GB in capacity.

The battery is the key selling point of this phone. Not only does it offer around twice the capacity of standard Android phones at 5350mAh, but the P5000 supports OTG (On-The-Go). This means that, using the supplied adaptor, you can create a Micro-USB to Micro-



USB cable and attach it to another smartphone (or hard drive) and, if you're feeling really generous, use the Elephone as a power bank. We tried this with our HTC Desire Eye, which also supports OTG.

A concern with large-capacity batteries such as this is that they will take forever to recharge. Not so with the Elephone P5000: given the correct charger it can fill its own battery up to 70 percent in one hour.

We do have some concerns regarding this super four-day (45-day standby) mega battery, however. On receiving the phone from Coolicool, the battery was flat. We charged it up, put it back into the box for a day, and when we took it out again to review the phone the battery was once again completely flat. We recharged and factory reset the phone, and battery performance seems better since, but it's not at all what we were expecting.

Left on standby, the P5000 consumes next to no power. Following the last charge we left it on standby for eight hours and returned to find it at 100 percent.

A key consideration when buying phones from overseas is whether they are compatible with UK networks. The P5000 operates on 850/900/1800/1900MHz 2G and 900/1900/2100MHz 3G, which means it will be compatible with EE, Three, Vodafone and O2's 2G and 3G networks. There is no 4G support.

As with many phones bought overseas, the Elephone supports dual SIMs (see our feature on page 100). This is becoming increasingly

attractive in the UK, allowing you to separate work and pleasure, yet carry just the one phone.

The fingerprint scanner is swipe-operated, and we had to swipe really slowly to get it to recognise a fingerprint. Samsung has used a touch fingerprint scanner (like Apple's TouchID) on its new Galaxy S6, which seems like a better approach.

As well as the aforementioned OTG support, the Elephone P5000 also boasts 802.11b/g/n Wi-Fi, Bluetooth 4.0, NFC and GPS.

An 8Mp camera is fitted to the front of the P5000, which is useful for selfies and video chat. It has a Face Beauty mode, although it doesn't offer a live preview.

On the rear is a 16Mp camera with an LED flash. There's support for HDR mode, face detection, smile shot, a 40-picture burst mode, and more. Video recording is supported at 1080p.

The P5000 runs Android 4.4.2, with few additions. Several useful gestures are supported, although switched off by default. From the lock screen you can double-tap to wake the phone, or draw a letter or swipe in a particular direction to open an app of your choosing.

Verdict

On paper the Elephone P5000 is a great phone at an attractive price. In reality, the battery life isn't as good as we had hoped, and the fingerprint scanner was sufficiently annoying to use that we probably wouldn't bother. Marie Brewis

£104 inc VAT**Contact**

■ doogeeemobile.com

Specifications

4.5in (960x540, 245ppi)
 IPS display; 850/900/
 1800/1900MHz 2G,
 850/900/1900/2100MHz
 3G, 800/2100/1800/
 2600MHz 4G LTE; dual-SIM
 operation; Android 4.4;
 1.5GHz MediaTek MT6732
 quad-core 64-bit
 processor; 1GB RAM; 8GB
 storage (plus microSD
 support up to 64GB); 8Mp
 rear camera with LED
 flash; 5Mp front camera;
 802.11b/g/n Wi-Fi;
 Bluetooth 4.0; GPS;
 HotKnot; 2000mAh
 battery; 65x81x132mm; 112g

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆

**SMARTPHONE****Doogee F1 Turbo Mini**

Like Elephone (opposite), Doogee is another new name to us, but popular outside the UK. Its F1 Turbo Mini smartphone is a super-sleek, super-budget 4G phone. It's a grey market phone (see our feature on page 96) supplied to us by Coolicool.com.

The F1 has a very nice design for such a budget handset. The screen bezels are virtually non-existent, and where we would normally expect to find a chunky chassis the phone is just 8mm thick. With a 4.5in screen the Turbo Mini is very easy to hold and use in a single hand, and at 112g it's incredibly light, too.

The slightly curved rear aids its fit in the hand, and the dimpled back panel - not unlike that seen in Samsung Galaxy phones - improves grip. It's much less plasticky in its appearance than other budget phones, such as the EE Kestrel, with a glass front, plastic rear and a metal chassis that's visible from the side.

The F1 feels reasonably tough, but the removable rear does mean it rattles somewhat when handled. Prise off this panel and you'll find dual-SIM slots (one full size, one micro), plus a removable 2000mAh lithium-ion battery and a microSD card slot that supports up to 64GB.

The screen is identical to that seen on the Kestrel: a 4.5in HD IPS panel with a 960x540 resolution that equates to 245ppi. Colours and viewing angles are good too, which is important when you consider that you're likely to want to stream video over 4G. It's not the best screen we've ever seen but it's more than acceptable, given the price.

Another area in which the Doogee improves on the Kestrel is in performance. The Doogee F1 is equipped with a 1.5GHz MediaTek MT6732 quad-core 64-bit processor and 1GB of RAM. This is not what we might consider a speed demon, but it's very capable when you consider how little it costs.

Storage is just 8GB, but that's already better than the 4GB we often see in budget phones. The Doogee also has a microSD card slot that accepts up to 64GB.

The fact this phone supports 4G is amazing, given the price. It's the cheapest 4G phone we've tested.



If you're buying the F1 in the UK, though, ensure it is compatible with your network. The Doogee supports 850/900/1800/1900MHz 2G, 850/900/1900/2100MHz 3G, and LTE bands 1/3/7/20 800/2100/1800/2600MHz. With a 4G connection Doogee claims it can offer up to 150Mb/s.

As we mentioned earlier, the Turbo Mini is also a dual-SIM phone. This will appeal to many users who want to combine business and home SIMs in a single handset.

Other connectivity options include 802.11b/g/n Wi-Fi, Bluetooth 4.0, GPS and something called HotKnot, which is a short-range wireless file-transfer protocol that is in essence MediaTek's answer to NFC.

At the front of the Doogee F1 Turbo Mini is a 5Mp selfie or video-chat camera. Within the main Camera app there's a Beauty Face mode that offers a live preview with a slider, allowing you to reduce wrinkles or (oddly) whiten your face.

Switch to CameraBox and you can trigger selfies with a smile or V sign. You can apply beautifying effects in real-time, and there's also an age judge mode that examines your pose and tells you how old you look. After you've taken a selfie you can apply make-up, though some of the effects are oriental-looking.

At the rear is an 8Mp camera with an HDR mode, face detection, smile shot, a 40-picture burst mode and more. It supports panorama, picture-in-picture, motion-tracking,



multiple-beauty face, multi-angle shots and more.

The Doogee runs the latest version of Android KitKat (4.4.4) and supports FOTA updates. The software is largely standard KitKat, with a few additions such as Music and Video apps and the aforementioned CameraBox. Go Keyboard is also preinstalled, and the Doogee supports some smart gestures. Examples include three-finger screenshots, two-finger volume and a double-tap of the Home button to lock the screen from any menu.

Privacy options include an app lock feature that lets you lock down specific parts of the phone from unwanted access, plus a Visitor mode, which hides away your pictures, texts and call logs.

The F1 Turbo Mini is fitted with a 2000mAh battery that, given the low-power screen and hardware, is more generous than it might sound. In our tests, after a working day's typical use, the battery had 60 percent remaining, suggesting it'll last at least a full day away from the mains and perhaps a little more depending on your usage.

The F1 also has an Ultra power saving mode that can shut down non-essential apps to keep things going as long as possible.

Verdict

We're impressed by the Doogee F1. It's better-looking and more powerful than any budget phone has any right to be. **Marie Brewis**

£135 inc VAT**Contact**■ prestigio.com**Specifications**

5.5in 720x1280 IPS, Gorilla Glass 3 display; 1.3GHz MediaTek MTK6582; 1GB RAM; 8GB onboard storage; SD card slot takes 32GB card; Android 4.4 KitKat; 13Mp, 2Mp cameras; Bluetooth 4.0; 802.11b/g/n; Micro-USB; 3000mAh lithium-ion battery; 156x78x9.2mm; 155g

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆

**SMARTPHONE****Prestigio Multiphone 5550 Duo**

The Multiphone 5550 Duo from Prestigio is a 5.5in dual-SIM Android KitKat smartphone with a quad-core chip and 13Mp camera. It retails for a low price of just £135, and has great battery life. So what's the catch? Let's take a look to find out.

A slab of black plastic fronted with Gorilla Glass 3, place the 5550 Duo next to the also 5.5in LG G3 and you will immediately notice that the Prestigio phone is bulky. Big, even. It's a lot longer than is the LG G3, and also a lot thicker at 9.2mm.

It's not hugely heavy, though, weighing in at 166g. And it feels lighter because that weight is spread out over a comparatively large shell. But this is not a phone for small hands. A female colleague felt that she couldn't have the 5550 Duo as her primary handset for exactly that reason. But if you have bucket hands it won't be an issue.

Nor will it be a problem if you are clumsy as it's built to last. The entire front fascia is made of Corning Gorilla Glass 3, and the back and sides is of a metallic plastic composite. Despite regular drop tests, we couldn't mark either. It's a robust device. Which is interesting because the back peels off to reveal the two SIM slots, a memory card slot and the removable battery. And on its own that backside feels thin and a little cheap. It does flex, however, which may be the secret of its success.

The Multiphone has a 5.5in IPS display, with a resolution of 1280x720. That makes for a pixel density of 267ppi. This is decidedly lower middle of the road these days, nothing like the mega sharpness of top of the shop models, but priced to match. And there is not a lot wrong with the display. It's certainly not the brightest or sharpest, but it is colourful and plenty bright enough.

Photos can look a little hazy around the edges, and colours lack a little punch. Video is similar: okay without being earth shattering. In general navigation you notice a little pixellation around the edges of icons, and an occasional general feeling of, well, being-a-bit-wetness. There's occasional ghosting during transitions and interactions. It's not super impressive, but we prefer it to the overblown nature of colours

in some more expensive OLEDs, for example.

With a MediaTek MT6582 motherboard, the Multiphone pairs a quad-core chip clocked at 1.3GHz with 1GB RAM.

Performance is okay, if not brilliant. And a mixed bag. In general it feels like a responsive device, but more intense visual processes such as gaming are a little flat.

One thing we love about the Multiphone is its excellent battery life. It's fitted with a 3000mAh cell, and we found that it could easily last more than a day in use - sometimes getting closer to two days. And when we left it on but unused over the weekend, in 72 hours the battery only lost 10 percent of its charge. Impressive.

Where the Prestigio starts to shine is its dual-SIM capability. You can load it up with both a full-size and a micro SIM. It doesn't take a nano SIM, though, you could always use an adaptor to put in either two micro SIMs or a nano SIM. We tested the phone with two SIMs (both UK Three SIMs), and found it worked seamlessly.

Other connectivity options include a 32GB Micro SDHC card slot, and 802.11 b/g/n Wi-Fi. It is a Bluetooth 4.0 handset, but offers only 3G, and not 4G.

It connects and charges via Micro-USB, and has a 3.5mm jack for your headphones. Other connectivity options include an FM radio, and GPS.

The Multiphone comes with Android 4.4 KitKat, and has full access to Google Play and all other features of recent Android. It's Prestigio's own version of Android, however, which may explain some of that storage hogging. The most noticeable difference to vanilla Android is that the fonts and icons are all slightly different. And Prestigio includes a special, er, clock (see above).



More important are the myriad apps that were installed on our review unit when it arrived. These include: Battery Doctor, Booking.com, Deezer, eBay, Flashlight, and Prestigio's own eReader and News and Weather apps. There's also Prestigio Plaza - Prestigio's own app- and hardware store. QuickSupport, Office Pro and Tap The Frog HD are all included, and take up space.

More helpfully all the apps we have installed on an LG G3 installed when we synched my account, which is another reason for relative lack of available storage.

But whichever way you look at it, Prestigio's installed apps take up a chunk of the 8GB storage. We hate the way that Android hardware makers do this, taking a cut to add in third-party apps and services - in a similar way to PC builders offsetting their costs with antivirus trials (and yes, McAfee can be found on this handset). It is the hidden price of a cheap smartphone, and for many it will be a price too far.

The 5550 Duo has two cameras, a front-facing 2Mp device for selfies and a 13Mp rear-facing camera. More specifically, this main camera is an 8Mp sensor interpolated to 13Mp, AF with Sony IMX179 sensor. It's actually pretty decent. Not likely to replace your DSLR any time soon, but certainly a worthy smartphone camera.

Verdict

The Prestigio Multiphone 5550 Duo offers a great feature set, in a well-built shell. If you need a dual-SIM phone, this is a great and inexpensive option. **✉ Matt Egan**

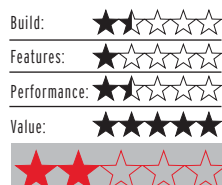
**Free with
£10 top-up**

Contact

■ nokia.com/gb-en

Specifications

GSM 900/1800MHz; Nokia S30 operating system; 1.4in (128x128, 129ppi) LCD with 16-bit colour; dust- and splashproof keypad; 384kB RAM; 3.5mm headphone jack (for use with FM radio, but headphones not supplied); 800mAh removable battery (35 days on standby, 12.5 hours talktime); Nokia AC-11 charger supplied; Mini-SIM; 107x44.8x14.3mm; 70g



FEATURE PHONE

Nokia 105

Nokia's 105 is a feature phone rather than a smartphone, and it lacks many of the features you might expect to find from Nokia's more familiar handsets. But that does mean it's cheap. Cheaper than cheap. Free, in fact.

Rather than Windows Phone or Google Android, the Nokia 105 runs the company's own S30 operating system. This supports Java apps, but you won't find any kind of app store installed. Neither does the 105 support 3G or Wi-Fi, so that rules out internet, email and even picture messages. This phone is strictly limited to traditional mobile phone tasks, such as making calls and sending texts.

The icon-led interface is intuitive to use, and some may even find it simpler than using Android or Windows Phone. You can scroll through a grid or list of menu options including Messages, Contacts, Call register, Settings, Clock, Radio, Reminders, Games and Extras, then select any of those options to dig deeper.

You can also tap left on the navipad to start a new text message (here restricted to 918 characters), right to open the calendar, or down to access contacts. From the home screen the Exit (or back) button brings up shortcuts to such things as the torch, radio, calculator and games.

Usefully, Nokia has preinstalled several useful utilities and a handful of games – including Snake Xenzia. Anyone who grew up in the 1990s will understand exactly where we're coming from when we say that this makes the Nokia 105 well worth a tenner of anyone's money, even if you were to use it not as a phone but just a device on which to play Snake.

Other games include Forbidden Treasures, Cricket Cup, Rapid Roll and Sudoku, but it's worth pointing out that these aren't the graphical masterpieces that you might download to a smartphone. That's part of their charm, of course.

Also on the Nokia 105 you'll find an alarm clock (and speaking clock), an FM radio, a calculator and converter, an expenses ledger, a timer, calendar, stopwatch and flashlight in the Extras menu.

Even the new Moto E (page 37) doesn't have an LED torch.

Customisation options are fairly limited, but you can change the ringtone (no Crazy Frog here), theme (background colour) and colour scheme.

We particularly like the ability to change the Welcome note for the rare occasion that you actually switch off or restart your phone, but on trying to type the obligatory 'Insert 10p' message we just couldn't get our head around the Nokia 105's predictive text. So rather than sticking with it, we used the hash key to switch to standard text input (this is also how you jump from lower- to upper case).

If you like the retro look you'll love the Nokia 105, which is available in blue or black. With this phone in my hand we feel almost as though we've gone back to my teenage years. But, to be fair, this feature phone is better-looking than many of the bulky handsets we had back then.

This Nokia 105 is tiny, and at just 107x44.8mm it's so comfortable to use in a single hand – that's something we haven't been able to write in a phone review for a very long time. It's chunky, too, at 14.3mm – but we like that. Built entirely from plastic and incredibly light at 70g, the extra depth helps the Nokia feel a little less toy-like.

Despite the plastic build it feels reasonably tough. Even if it breaks, at this price we wouldn't be too upset. The plastic rear is removable, revealing an also-removable 800mAh battery. You're unlikely to need to swap this one out on the road, however – Nokia claims the battery keeps going 35 days on standby or 12.5 hours for talk time. And that's fortunate, because the proprietary Nokia charger will make recharging on the go impossible unless you carry with you the dedicated charger.

The LCD screen is just 1.4in with a 128x128 resolution, equating to a pixel density of 129ppi. That's half what we see in the typical sub-£50 smartphone, but on a tiny screen that doesn't do photos – even picture messages – it's acceptable.

The Nokia 105 supports 16-bit colour, and we were surprised to find



such good viewing angles from the side. But the screen is also recessed under the glass, and so small that we can't imagine why you might want to look at it from the side.

If it's not obvious, this is not a touchscreen. Instead, the phone is operated via a numberpad and four-way navipad, plus you'll find Select and Exit (back) buttons, and start- and end call buttons. The latter is also used to turn off the Nokia 105 with a long-press, with no physical buttons to be found on the phone's edge. Rather than a volume rocker, you'll need to enter the Settings menu to adjust the ringing volume and specify whether or not you also want the phone to provide haptic (vibration) feedback.

It's important that you understand the Nokia 105 is not a smartphone before you consider purchasing it. This feature phone supports only 900- and 1800MHz GSM, which means you won't be using it to get online. That means no web browser, no email, no instant-messaging and no social media.

Verdict

This isn't a smartphone, so it's unfair to compare it with the phones we usually review, but if all you want to do is make calls and send texts the Nokia 105 offers the best deal we've ever seen. **Marie Brewis**

£285 inc VAT**Contact**■ zotac.com**Specifications**

nVidia GeForce GTX 960;
2GB GDDR5; 1266MHz Core
Clock (boost to 1329MHz);
1752.5MHz Memory Clock
(7.1GHz DDR effective);
128-bit memory interface;
1024 Stream Processors;
64 Texture Units; 32 ROP
Units; PCI-E Interface;
DirectX 12; 1x DVI, 1x HDMI,
3x DisplayPort; 1x 6-pin
PSU connector needed;
5-year warranty

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**GRAPHICS CARD****Zotac GeForce GTX 960 Amp! Edition**

The GTX 960 isn't the first card we've looked at that features a GPU from the Maxwell family. Indeed, the 750 Ti set the ball rolling in early 2014. This product didn't represent much of a step forwards in terms of raw frame rates, but it did offer huge savings in power. The later 970 and 980 would show what could be done with this excess power, producing searing game scores without going too over the top on wattage. The 960 marks another slight tweak.

It's built around the GM206 Maxwell GPU - the 970 and 980 both employed the GM204 - and effectively goes just beyond halfway towards the specifications of the 970/980. In effect, then, that means 1024 stream processors and 64 texture units rather than 1664 and 104 respectively for the 970. The 970, then, is a far more powerful product - with an almost £300 price tag to match - and there is one area in which the 960 falls very short indeed. But we'll come back to that.

In truth, the 960 isn't competing against the 970. Instead, its main opposition will come from the mid-range Radeon cards - in particular, the 285 and the 280X. And here, the 960 looks - on paper, at least - rather inferior. Its 1024 streaming processors are dwarfed by the 1792 and 2048 of the 285 and 280X respectively. And while it matches the Radeons with its 32 ROPs, the 960's 64 texture units are again vastly inferior - the 285 and 280X have 112 and 128 texture units respectively.

The 960 does pull ahead on clock speeds, since it has a power-light GPU and blisteringly-fast 7GHz memory that allows these figures to be pushed to the max. So whereas the default 285 and 280X have core clock speeds (with Boost) respectively of 918MHz and 1GHz, the standard 960 hits a startling 1178MHz. And, this being a specially overclocked version from Zotac's exclusive AMP! range, that figure is pushed up to a quite incredible 1329MHz. The Zotac also adds a burst of extra speed to the memory itself, pushing this up to 7010MHz.

However, even Zotac can do nothing about the 960's apparent shortcomings. The lowly complement of 64 texture units is



something of a downer, and even with the immense overclocking, it can only muster a texture fill rate of 85.1GT/s. The 285 and 280X can generate figures of 102.8GT/s and 128GT/s respectively, giving them a theoretically much greater facility for handling detailed graphics information. And it gets worse when you look at the memory. For while the Zotac 960's memory is clocked at a sizzling 7010MHz - the 285 and 280X have comparative figures of just 5.5GHz and 6GHz - it's nonetheless hampered by a 128-bit memory interface.

We're unused to seeing 128bit buses at this price point, so this comes as something of a shock. And it means that the Zotac stumbles to a memory bandwidth figure of just 112.2GB/s. In contrast, the 285, with its 256-bit bus, registers a figure of 176GB/s. And the 280X, blessed with a 384-bit bus, notches up a mighty 288GB/s. Neither is the Zotac's 2GB of memory particularly impressive - the 280X has half as much again.

So, based on the hardware, it looks like bad news for the 960. But then, were you really expecting nVidia to make it so easy for its rival? As it turns out, the 960 has a few tricks and devices that allow it to make up much of this ground. The advanced colour compression technology on Maxwell means that the GPUs can do rather more with reduced memory bandwidth. Indeed, the design is rather more efficient across the board, allowing nVidia to make full use of those clock rates.

That comes across in the game framerates, where the GTX 960 comfortably beats the 285 in all of our tests, and gets close to the 280X in the majority. In Crysis 3, for instance, the Zotac notches up figures of 37- and 21.3fps at

1900x1200 and 2560x1600. The 280X is just ahead, on 39.8- and 24.6fps. Even in the latter case, the gap is only just over 3fps. The 285 comes up with figures of 32.9- and 19.7fps, only closing the gap at the higher resolution. In the demanding Assassin's Creed Unity, the gaps are even smaller - the 960's figures of 31.2- and 21.1fps being 1.9- and 0.9fps behind the 280X, and 3.3- and 1.9fps ahead of the 285.

And, all of this is achieved for a TDP of just 125W. That's as opposed to 190W for the 285, and 250W for the 280X. The real-world performance gap saw the 285 generating around 75W more than the 960 in standard gaming tests, with the 280X a further 30W down the road. These are amazing figures for cards that are supposedly competing with one another. The 960 is reasonably thickset (about 40mm in depth), but not amazingly long, at 205mm - although do measure up if you're putting this into a PC where space is likely to be an issue. This Zotac version also requires just one 6-pin connector from the GPU - again testament to its superb efficiency.

The ample ports include three DisplayPort, and DVI and HDMI connectors. This nice dual-fan version generates very little noise, and the cooler can disable itself when the PC is idling, so the card will be a great addition to more discreet PCs. It also offers full HEVC (High Efficiency Video Coding), which will be particularly crucial if you want to store or transmit video with 4K resolution. That's probably not very likely for the typical 960 user, but such support is still rare, so it's nice to see it provided here.

Verdict

If low power consumption is a must, then the 960 is an obvious buy at this price point. However, if you're more interested in raw figures, it's a harder decision. **Robin Morris**

£129 inc VAT**Contact**■ smsaudio.com**Specifications**

Heart rate monitor works with following devices: Apple iPhone 4s, 5, 5s, 5c, 6, 6 Plus; Samsung Galaxy Note II, Galaxy Grand II Duos, Galaxy S4, Galaxy S5; LG Nexus 5; Motorola Moto X. Compatible with RunKeeper for iOS and Android. IPX4 sweat and water resistant Protective carry case and three sizes of ear gels included; 14.6x6.4x14.6cm; 358g

Build: ★★★★★

Features: ★★★★★

Performance: ★★★★★

Value: ★★★★★

**HEADPHONES****SMS Audio BioSport**

These SMS Audio BioSport headphones are part of a growing trend of devices that help you keep track of and measure your fitness.

A flat, anti-tangle cable plugs into your smartphone via the 3.5mm headphone jack. You'll need to secure the cable to an item of clothing, though, in order to stop it flying all over the place. We had trouble with this on a windy jog, and eventually had to stop and run the cable underneath our shirt to stop it from flapping about.

If you're using a case with your smartphone, you might have trouble with these, as the headphone jack is connected to the cable at a right angle rather than in a straight line. During testing with an iPhone 5c, we used a CaseMate Naked Tough case that covers the edges of the phone as well as the back, and it meant that we couldn't push the headphones all the way into the jack without removing the case.

The ear pieces themselves have an oddly-shaped tip that's paired with an upwards pointing wing that's surprisingly comfortable in the ear.

We experimented with different-sized tips (you'll get several options in the box) and eventually settled on small, which fit so well that they take a moment longer than usual to remove. This means you can be secure in the knowledge they won't fall out when you're on a run, and stop measuring your heart rate.

On the cable, positioned suitably close to your mouth, is a microphone and remote control module that you can use to answer calls, play and pause your music, skip tracks and more using various button press combinations as detailed in the user manual. Unfortunately, you can't use it to change the volume, so you'll have to get your phone out to change this.

There's also a switch that turns on Heart Rate monitoring mode.

When answering a phone call, you'll need to slide the switch down to answer in microphone mode.

The good news is that these headphones are IPX4 rated, which means they're resistant to sweat and rain. You also get a carry case in the box for safe storage in your bag.

The SMS Audio BioSport headphones are compatible with iOS and Android, but not all smartphones are supported.

If you've got an iPhone 4s, 5, 5s, 5c, 6 or 6 Plus; Samsung Galaxy Note II, Grand II Duos, S4, Galaxy S5, Nexus 5 or Motorola Moto X, then you'll be able to use these headphones. For everyone else heart-rate monitoring isn't supported, so you'll want to look elsewhere.

Right now they only work with RunKeeper, which is a shame for anyone who uses a different fitness app, and a bit cheeky because on the box it says "works with leading fitness apps". You'll get a month's free subscription to the Elite RunKeeper package with every purchase.

There's no dedicated app either, which is a shame for those who don't already use a fitness app but would like one that is tailored for use with these headphones.

During our tests, we struggled to get the RunKeeper app to monitor our heart rate on an iPhone (on Android RunKeeper will automatically detect the headphones as a heart-rate



monitor). We also found that the user manual lacked instructions to help. We eventually got it working, though, and after that first struggle it worked instantly every time we plugged the headphones in to the iPhone and launched the app.

The heart-rate sensor is discretely located in the right earbud and didn't falter during our tests.

Sound quality

Thanks to the tight seal and comfy design, using the BioSport headphones even without the heart-rate functionality is still enjoyable. The sound quality is good, if a little lacking in bass, leakage is kept to a minimum and you won't get interference from wind. Some tracks did suffer from a bit of echo during our testing, though.

We wouldn't recommend buying these headphones if you're after top quality sound, but for sports headphones with the added heart-rate monitoring functionality they won't disappoint.

Verdict

If you're a fitness buff and want to add heart-rate monitoring into the mix when it comes to workout data, then these are worth considering. For the same price, you could have a Fitbit ChargeHR which tracks heart rate 24/7 and offers plenty more fitness stats besides. **Ashleigh Allsopp**



£56 inc VAT

Contact

■ jabra.com

Specifications

Bluetooth 4.0, up to five hours talktime; up to 10 days standby; USB charging, NFC; cable length 60cm; 6mm dynamic speaker; 18x21x32mm; 16g

Build: ★★★★★
Features: ★★★★★
Performance: ★★★★★
Value: ★★★★★



HEADPHONES

Jabra Sport Plus Wireless

Jabra's Sport Pulse wireless in-ear headphones aim to help keep you motivated during your workouts. They allow you to listen to your favourite music, while discreetly tracking your heart rate and offering regular updates on your workout progress.

At first glance you'd be forgiven for thinking that these headphones are going to be uncomfortable to wear. They have an extra portion that houses the heart-rate tracker and other tech sticking out at the bottom. This, however, helps keep the earphones in place, and the small rubber wing that sticks up from the main portion of the headphone provides extra support.

In use, we found the Jabras to be incredibly comfy. They managed to stay in our ears for the majority of our workouts and runs, and after experimenting with the various different ear wings and headset buds provided (three wing sizes and four bud sizes), we managed to find a combination that suited us.

There were a couple of occasions when one of the earphones would move out of place slightly and therefore momentarily lose the ability to monitor our heart rate, but you'll be subtly alerted if this happens by the soft-spoken female voice that Jabra's used for the headphones, so you can quickly

adjust them rather than get back to find that your workout wasn't recorded properly.

As these headphones are wireless, connecting quickly and easily to your device via Bluetooth or NFC, there's just one reasonably short cable that sits behind your neck as you run. Small clips have been provided to help you make this cable more comfortable.

There are a few buttons on the headphones that allow you to control various things. For example, a remote control on the cable lets you increase or decrease the volume, skip tracks or activate Siri if you're using an iPhone (there's a microphone there, too).

On the outside of the left earbud is a physical button that, when pressed, will give you an update on your workout progress.

In terms of durability, the Jabra Sport Pulse seemed sturdy and robust during our testing, and they're water-resistant so you won't need to worry about sweat or rain.

Fitness features

Paired with the dedicated Jabra Sport app, you'll be able to use these headphones to track activities including running, cycling, walking, hiking, skating or skiing, and even gym-based activities such as walking or running on a treadmill.

You won't be able to track your steps, but you will find information about the duration of your workout, the distance travelled, your average pace and an estimate of how many calories you burned. You'll also see your heart rate, which is also used to calculate when you're in the light training-, fat burn-, cardio-, intense- or maximum zones, all of which we found interesting post-workout.

By default, the headphones will fade out your music and give you a workout update including distance (it utilises the GPS in your smartphone so you'll need to have it turned on), pace, heart rate and training zone every 10 minutes or after every two kilometres, but if you feel that's too regular or not regular enough you can change it in the settings menu.

If you've got a particular goal in mind for your workout, you can set a



target distance, time, calorie burn or pace, or set a target heart rate zone that you'd like to reach. Then, when you've reached that goal, you'll be congratulated by the headphones. You can also set up your own custom interval training workouts.

When you've finished your workout, you'll get a detailed summary, which can include a map of where you travelled, and an analysis of your heart rate during your workout. You'll also find out whether you beat your personal bests for the week, month or year.

The sound quality is certainly not the best we've experienced, but for sports headphones it's fine. There's just enough bass to help motivate you during your workout, but not too much that it becomes overpowering. At high volumes there's a little distortion, though you won't need them that loud.

Battery life

During our tests, the Jabra's battery lasted for around five hours. Having to charge headphones at all is something you'll need to get used to, but it's the price you pay for the huge benefit of no wires to get tangled up in during workouts.

The good news is that the battery level indicator you'll see when you launch the Jabra Sport app seemed to be very accurate during our testing, which is helpful it'll allow you to decide whether your battery is going to last the full length of your workout or whether you need to plug them in to get a bit of extra juice before you set off.

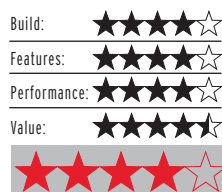
Verdict

You won't get the sound quality that you'd expect from any ordinary pair of headphones, but for the added fitness extras it'll be a price that many sports enthusiasts are willing to pay. **Ashleigh Allsopp**



£26 inc VAT**Contact**■ hisgadget.com**Specifications**

5W speaker; Bluetooth 4.0/AUX connection; 500mAh lithium-polymer battery; 90Hz to 18KHz frequency response; 80db sensitivity; noise-cancelling mic; 64.5x64.5x70.1mm; 261g; 12-month warranty

**BLUETOOTH SPEAKER****iClever IC-BTS02**

iClever's Bluetooth Wireless Speaker is one of the best cheap Bluetooth speakers we've tried. It sounds good, it looks great and it's affordable.

It's surprising just how much sound emanates from this tiny zinc-alloy box. Given that you can easily fit the 64.5x64.5x70.1mm, 261g iClever in a single hand, the 5W speaker hidden inside does a much better job than we should reasonably expect from such a portable Bluetooth speaker, both good on bass and free from distortion at high volume.

The 5W speaker inside the iClever offers bedroom-filling sound that's much louder than what's available from your phone, tablet or laptop, although its meshed-top design forces it to throw audio upward rather than around the room. With Bluetooth 4.0 technology it also boasts good range (up to 33ft), and we experienced no dropouts walking room to room with paired phone in hand. If your mobile device doesn't support Bluetooth

you can instead use the Bluetooth Wireless Speaker's AUX connection, and a cable is included in the box.

Pairing a device over Bluetooth is as simple as flicking a power switch and then finding and tapping on the iClever in your phone or tablet's Bluetooth Available devices menu. It device can remember up to eight Bluetooth connections, which is useful if several family members will be using it, and will automatically connect to the last paired device when available.

The price is appealing. While you'll find many Bluetooth speakers listed online that feature the same design - a premium-feeling glossy black zinc-alloy box with blue trim, each with their own vendor's logo stamped on the front - the iClever is the cheapest we found, at £26 on Amazon. Our only gripe with the design is its penchant for fingerprints; sat and left on the side this may not matter, but the iClever features three bottom-mounted buttons for altering the volume



and playing, pausing and skipping tracks, which force you to pick up the speaker.

It also has a noise-cancelling mic that can capture dialogue from up to 2m; a button on the front of the device lets you accept phone calls and chat via the speaker itself.

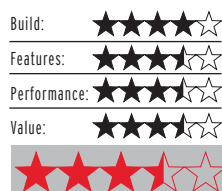
Battery life is good, and with its Bluetooth 4.0 tech, you can expect eight- to 12 hours of playback.

Verdict

We really like iClever's Bluetooth speaker is portable, good-looking and offers more than adequate sound. **Marie Brewis**

£50 inc VAT**Contact**■ inateck.com**Specifications**

Portable Bluetooth speaker; 2x 3W speaker drivers; Bluetooth 4.0; 2100mAh lithium-polymer battery (9 to 15 hours life); soft carry case; 165x60x50mm; 390g

**BLUETOOTH SPEAKER****Inateck BTSP-10**

This Inateck speaker has one of those designs you'll either love or hate. I quite like the hexagonal, almost industrial-looking pattern that forms the speaker mesh and wraps around the sides.

Rectangular in design at 165x60x50mm, the 390g speaker is a lot heavier than it looks. It packs some pretty good audio hardware for the price, though, with two 3W precision-tuned drivers. It's still portable, and despite its rugged appearance Inateck supplies a soft carry case to protect it on its travels.

It's easy to operate, with the power switch, AUX and Micro-USB charging ports on one side, and three buttons up top - volume up, volume down, and a Bluetooth button that does everything else, including playing- and pausing audio, and answering- and ending calls.

Setup is simple, though we did need to read the instructions. Unlike every other portable Bluetooth speaker we've tried, you can't just switch it on and then instantly pair it



with your phone. You need to switch it on, then hold down the Bluetooth button for six seconds to enter pairing mode, at which point the Inateck will become visible in your Bluetooth settings.

Unlike most portable Bluetooth speakers, we were disappointed to find that the volume buttons didn't also allow you to skip the track. To use this speaker to its full potential, you will still need to interact with the music app on your phone or tablet, which is annoying.

Nevertheless, the Inateck has plenty in its favour. First and most notably is its volume. For a cheap portable speaker, this thing is loud. Much, much louder than what is possible from your phone, tablet or laptop. And sound quality is no

different at max volume than when it is little more than a whisper.

Secondly is its Bluetooth 4.0 connectivity, which is an improvement over the older versions of the standard used by most cheap speakers, and more power-efficient. It won't unreasonably draw on the battery of your mobile device, and its own built-in 2100mAh lithium-polymer battery is able to last between nine- and 15 hours.

There is always some compression when you're streaming music over Bluetooth, but we mostly found audio crisp and clear.

Verdict

At £50, the Inateck BTSP-10 is a loud, cool-looking speaker. Sound quality is good, too. **Marie Brewis**

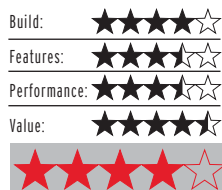
£9 inc VAT

Contact

■ aukey.com

Specifications

3600mAh lithium-polymer power bank; 5W (5V, 1A) Lightning input; 7.5W (5V, 1.5A) USB output; 124x46x12mm; 85g; 18-month warranty



POWER BANK

Aukey PB-N30 3600mAh

Aukey's 3600mAh External Battery Charger is the first power bank to charge from Lightning rather than Micro-USB, making it a must-have for iPhone users who don't want to carry both cables.

We say iPhone users; it will charge any phone, tablet or other USB-powered device, you just need to supply your own USB cable. But the Aukey refills its own battery over a Lightning rather than Micro-USB connection, and we know of few Android- and Windows Phone users who have one of these.

Lightning was introduced by Apple in September 2012 with the iPhone 5, fifth-generation iPod touch and seventh-generation iPod nano. A month later, the technology was added to the fourth-generation iPad and original iPad mini. Older iOS devices use the 30-pin dock, but if you have any of these or later iOS devices then the Aukey's 3600mAh battery charger is worth a look.

Particularly the iPhone. Aukey doesn't state its battery's efficiency,

but with most offering around 70 percent (some is lost through heat generated and voltage conversion), you can expect around 2500mAh. That's not enough to completely fill an iPad's battery, but it would fill an iPhone 5 (1440mAh), 5c (1507mAh) or 5s (1570mAh) around 1.7 times, an iPhone 6 (1810mAh) around 1.5 times, and it would give a 6 Plus (2915mAh) just under a full charge.

The LED will go through various colours while charging to show you how much power remains: white means more than 60 percent; green is between 20- and 60 percent; and red is below 20 percent.

The battery tech inside this power bank supports auto-on/-off, too, so you can plug it in and leave it be: it'll automatically switch off when either it or your iPhone's battery is full, with no wastage.

Note that this Aukey power bank will charge your iPhone faster



than it will fill its own battery. That's

because it has a 7.5W

output and just a 5W input. Apple's own iPhone charger is rated at just 5W, but if fast charging is what you need then you should note that some power banks offer up to 12W via USB. (Charging your iPhone at more than 5W won't hurt its battery.)

Leaving the tech aside, Aukey's charger is a nice-looking device. It's built from matt black plastic, with rounded edges and a very slim (12mm) and light (85g) design. There's just a single output, but at this capacity a second output would be pointless.

Verdict

Amazing value at £9, a Lightning charging port and 3600mAh capacity make this power bank the perfect accessory for the iPhone 5, 5s, 5c and 6. Marie Brewis

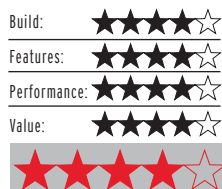
£13 inc VAT

Contact

■ aukey.com

Specifications

4400mAh power bank with built-in windproof cigarette lighter; 5V 2A (10W) Micro-USB input; 5V 2A (10W) USB output; charges in 2.5 hours; 73x21x52mm; 145g; 18-month warranty



POWER BANK AND CIGARETTE LIGHTER

Aukey PB-C1 2-in-1 External Battery and Cigarette Lighter

When Aukey got in touch about its latest power bank we had to take a look. Fire and batteries - you're not supposed to put those together, right? Well you can take peace of mind from the fact there's no open flame here. You slide across the button on the top of the External Battery to reveal a thin wire coil, which instantly heats up and within a second is glowing and ready to light your cigarette.

From a full charge Aukey says you can light around 240 cigarettes from the 7W element. That's assuming it takes 30 seconds to light each cigarette, so we'd suggest you'll actually get many more.

Unlike a flame, this element is windproof, making it ideal for use outdoors. That's where the other element of this gadget comes into play, too. When you're miles from a power socket and your smartphone's on its last legs, a power bank can get you through the day.

Aukey doesn't list the efficiency of its 4400mAh battery, but with

most averaging 70 percent, it could offer just over 3000mAh to power your mobile devices. That'll provide most recent Android phones with at least one full charge; iPhones and lower-end devices potentially two. (Check the spec of your phone's battery to work out what you can expect.)

The Aukey offers a fast charge for your phone. Both the Micro-USB input and USB output are rated at 10W (5V, 2A), which may be twice the power of your standard smartphone charger. Rest assured this faster charge won't damage your phone, with its battery drawing only what it requires. Given a 10W charger it will also refill its own battery in 2.5 hours.

It offers great value at just £13, particularly given its primarily metal build. The two end pieces are made from plastic, which we did notice easily scratched in our tests, but on the whole it looks good.



At 145g and 73x21x52mm, it's large and heavy for a cigarette lighter, but for a 4400mAh power bank it's extremely pocketable and very well sized.

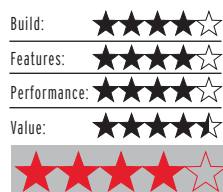
A single LED is used to show how much power remains: when blue there is between 20- and 100 percent; when red it is below 20 percent. No other information is given on its status.

Verdict

This 2-in-1 battery and cigarette lighter is ideal for smartphone carrying smokers. Marie Brewis

\$40 (£26)**Contact**■ ianker.com**Specifications**

15000mAh power bank; 1x 1A (5W) USB output; 1 x 2A (10W) USB output; 1x 1.5A (7.5W) Micro-USB input; carry case; 126x77x24mm; 316g; 18-month warranty

**POWER BANK****Anker Astro E5 15000mAh**

The Anker Astro E5 is an easy-to-use power bank that offers pretty good value and useful capacity, without being too big and heavy to take on your travels. With 15000mAh on offer you can expect around 10500mAh to be available to your devices – roughly 30 percent is lost from the premium LG battery cells inside through heat generated and voltage conversion. This would charge an iPhone 6's 1810mAh battery nearly six times, although Android phones typically have larger-capacity batteries so expect fewer charges.

The Anker Astro E5 very much reminds us of the RavPower RP-PB13 Deluxe, a £23 14000mAh power bank that has a similar rectangular design, encased in black plastic with a silver-painted central band. This Anker has a gloss finish that's a magnet to fingerprints, however, and its silver power button and four status LEDs stand out more than the smaller black button and blue LED strip seen on the RavPower.



There is little difference in their size and weight, although we prefer the RavPower's design.

The specs are incredibly similar, too. Both feature 1A (5W) and 2A (10W) fast-charging USB outputs for simultaneously charging a phone and tablet, although here they sit either side of the LED flashlight rather than to the left. And both have a 1.5A (7.5W) Micro-USB input for refilling their own batteries.

There is really very little separating between the two, and your decision will likely be swayed by their design

rather than the small differences in price and capacity. This Anker's 18-month warranty is also attractive.

Neither Anker nor RavPower support advanced features such as passthrough charging, so you won't be able to simultaneously charge your phone, tablet and power bank without using a pair of mains sockets.

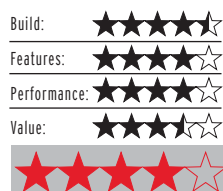
Verdict

The Anker Astro E5 15000mAh is a decent power bank at a good price.

☒ **Marie Brewis**

£111 inc VAT**Contact**■ brydgekeyboards.com**Specifications**

iPad Air and Air 2 compatible; 520g; aluminium; 180-degree tilt; backlit keys; stereo speakers; 3-month battery life

**iPAD ACCESSORY****BrydgeAir for iPad Air/Air 2**

Following in the footsteps of the Brydge+ for iPad, the Brydge Air has been designed with the iPad Air in mind. You can't ruin the slim form factor of the iPad Air with a chunky, ugly case right? Thankfully that's not true with the Brydge Air – instead of taking away some of the elegance of the iPad, it adds to the experience and transforms your tablet into a MacBook look-alike.

As with many iPad keyboards, the keys have been reduced in size. Usually this means that inaccuracies start to appear in your typing, but with the BrydgeAir it wasn't the case.

We found no real adjustment period and typing speeds were close to what we achieve with a normal sized keyboard. There are only two real issues for UK users – there's a \$ button but no £ button, and the Enter key is only one row wide when usually its two.

There's no real surprise that it's constructed from aluminium because it's clear that Brydge wanted a keyboard that looked like

it belonged with your (Aluminium backed) iPad Air. The keys are black, made of plastic and feel great to type on.

A new addition from the older generation Brydge keyboard is a backlight keyboard much like the MacBook Air. While some may think of this as a novelty that drains battery life, it enables you to type more comfortably in low light.

It's designed so that your iPad slots into the hinges simply and easily and is held in place thanks to the friction caused by rubber inserts. It also comes with shims that fit into the hinges, to be used with the even thinner iPad Air 2.

We were particularly impressed by the viewing angles as you can tilt the iPad back to almost 180 degrees. This means that you can get a comfortable angle to work with.

When you're done, you just close it as you would a normal laptop and the magnets built into the BrydgeAir turn off your iPad.



In the previous generation of the Brydge keyboards, you had to pay extra to get built in speakers but with the BrydgeAir, they come as standard. While the original speakers were set just above the keyboard, facing you, on the BrydgeAir they've moved to the back, just underneath where your iPad sits. While this made no sense to us on first glance, during testing we still had satisfactory results with the speakers. They're not the greatest speakers in the world with a lack of bass, but they definitely contribute to the laptop illusion.

Verdict

The BrydgeAir is a great for people that don't want to carry both an iPad and a laptop. ☒ **Lewis Painter**

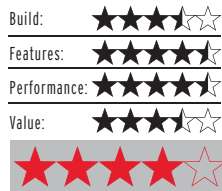
£35 inc VAT

Contact

olixar.com

Specifications

Six-port desktop charger; 6x 12.5W (5V, 2.5A) USB outputs; 50W total output; 100x69x26mm; 189g



POWER BANK

Olixar 6 USB Smart IC Charger

Olixar's six-port desktop charger is very similar to the Zendure 5-Port Turbo Desktop Charger (below). It's a little more expensive, but in return you get faster-charging and a reassuring two-year warranty. It's also got an extra output when compared to the Zendure.

When choosing a desktop charger a key consideration is how much power it can deliver. It could have 10 USB ports, but if it weren't able to support all at once it would be no better than those devices that have just three or four.

It's a six-port desktop charger with a 50W total output. That's an improvement over the five-port, 40W Zendure, but with all ports in use the difference between how much power is delivered is minimal.

Assuming all devices plugged into the Olixar are drawing maximum power, this desktop charger can deliver 8.3W to each. However, like the Zendure and iClever, intelligent technology (here known as Smart IC) built into the

device recognises the attached gadget and automatically delivers the correct amount of power. The maximum a single port can deliver is 12.5W, which is slightly up on the 12W offered by the competition, resulting in faster charging for your connected devices.

The Olixar is a sleek white plastic device, but its design is marred somewhat with the specs plastered on one edge. The edges are rounded, yet not entirely smooth, and we found this white device could pick up dust from the desk.

It's a little larger and heavier than the Zendure and iClever, although you'd notice the difference only if you were to place all three



side by side. All three feature a 100- to 240V AC input at one end, and six (five for the Zendure) USB ports at the other.

As well as supplying a generous two-year warranty for peace of mind, the Olixar builds in an automatic safety cut-off should it be required.

Verdict

A tad more expensive than some of its rivals, Olixar's desktop charger adds value with a lengthy warranty and six faster-charging USB ports.

✉ Marie Brewis

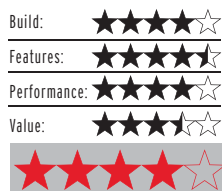
£26 inc VAT

Contact

zendure.com

Specifications

Five-port USB hub; 5x 12W (5V, 2.4A) USB; 40W total output; 97x60x27mm; 166g



POWER BANK AND CIGARETTE LIGHTER

Zendure 5-Port Turbo Desktop Charger

Desktop chargers aren't just useful in the home either, they're also great for taking on holiday and prevent us having to carry multiple power adaptors in our suitcases. This Zendure works with any 100- to 240V AC input, and is supplied with a UK three-pin plug.

It stands out among a sea of devices that in essence do the same thing in two ways: it's very compact, just 97x60x27mm and 166g; and it builds in Zen+ technology, which it uses to intelligently recognise each plugged-in device and then deliver an optimal amount of power for charging.

It's a well-built rectangular device with rounded edges and encased in glossy black or white plastic. A silver band with Zendure logo wraps around the desktop charger's body, while you'll find an AC input on top and five fast-charging USB ports and a power indicator at the bottom.

We've seen desktop chargers that cost less and are only slightly larger that offer six USB ports,

though, such as the Olixar (above). When you're choosing a desktop charger, you should take into account not only how many ports it offers and how much power each delivers, but also how many of those ports it can support at once.

The Zendure has a maximum output of 40W, so to the untrained eye it immediately looks inferior. By offering 40W to five ports it is able to deliver 8W to each, which is still faster than the 5W output of many smartphone chargers, and not far enough behind the Olixar for you to notice a difference.

For both desktop chargers this is where intelligent charging technology comes in (SmartID for the iClever, and Zen+ for the Zendure). Not all devices require the full 12W, so by giving each device exactly what it wants more power is free for other phones, tablets, MP3



players, cameras, smartwatches, fitness trackers and the like.

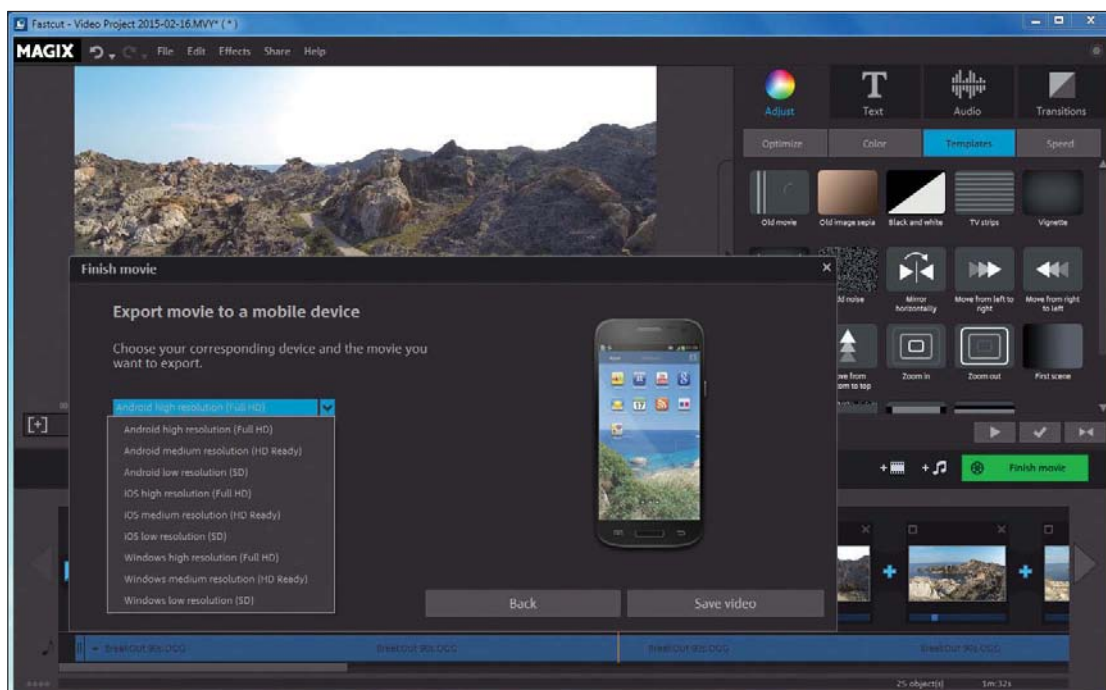
Zendure's 5-Port Turbo Desktop Charger builds in protection for over-voltage, over-current, leakage and short circuit, and it comes with a 12-month warranty.

Verdict

The Zendure 5-Port Turbo Desktop Charger is a neat and intelligent device for charging multiple USB-powered gadgets from a single mains outlet. We've seen lower-cost examples with an extra port, but the Zendure wins on its more compact dimensions. ✉ Marie Brewis

£60 inc VAT**Contact**■ magix.com/gb/**Specifications**

Windows 7 SP1/8/8.1
64-bit; 4GB RAM; 10GB
HD; 2GHz multi-core
processor

TABLET**MAGIX FastCut**

MAGIX, the prolific German software maker, has long produced well-received video editing packages, like Movie Edit Pro, but if you want to put together a holiday or activity video without spending a long time editing, you need something simpler and more automated.

MAGIX FastCut is designed to provide just that and is particularly geared to people with GoPro sports and action cams. These cameras can capture video at up to 4K resolution and are designed to be body or stick-mounted to record activities such as biking, snowboarding or climbing.

GoPro cameras

The software caters for the GoPro cameras with a number of customised templates, but this doesn't prevent it being used with other video sources. FastCut works with a similar paradigm to other editing software, where you load the video footage, edit it into shape, add a music soundtrack if required and save or upload the finished video.

The main editing screen is laid out very conventionally, with a large video preview pane top left, a scene arranger with video and audio channels along the bottom and a tool 'pool' at top right.

FastCut does a lot of stuff for you automatically. When you import

a video file and pick from one of the 15 pre-defined templates, the program supplies a music track and makes cuts between scenes. Music can be from smooth and subtle, to rock, to electronica and the cuts can be hard or soft, all put in place by the software.

Stabilising footage

If parts of your video are shaky or unstable, the program stabilizes them, within limits - there's certainly an improvement. Fisheye distortion as in the wide-angle setting of GoPro cameras, can also be removed, flattening out the picture.

The program can handle videos up to HD and 4K resolution, but to help maintain playback speeds within the FastCut editor, the program creates a lower res proxy file, which is what display, until you render the full video, once you've made your edits.

You can switch to a manual mode, which gives control over elements that are normally handled automatically within a template, but you can't then reimpose the template, without starting again. There are a number of effects you can add on your own, from typical wipes to old movie, vignette and noise effects, to give the footage atmosphere. The soundtrack from the original video can be manually


balanced with the music track, so neither drowns the other.

Once you're satisfied with the video, you can export to various online sites or to supported mobile devices. The software supports YouTube, Facebook, Vimeo, showfy and MAGIX's own online album directly, but you can also save in other formats for your own blog or website.

If you'd prefer to play it back on a tablet or phone, you can save in low, medium or high resolutions for Android, iOS or Windows platforms.

The system requirements specify a multi-core 64-bit processor running at at least 2GHz with 4GB of memory and Windows 7 or above. This rises to a quad-core with 8GB for editing 4K video. Much less than the minimum requirement and video playback starts to stutter, making it hard to work.

Verdict

MAGIX FastCut is a very easy way to shape your action or sports video footage into professional-looking videos and export them to internet sites or onto your own mobile device. The level of automation, tied in with a good choice of templates for GoPro cameras and others, speed video making and the manual options provide extra control when you need it.  **Martyn Casserly**

Ease of use: ★★★★★

Performance: ★★★★★

Value: ★★★★★



£1,503 ex VAT
£1,804 inc VAT

Contact

■ hp.com/uk

Specifications

Quad-core 3.4GHz Intel Xeon E3-1246v3; 32GB RAM; 256GB M-SATA drive, 1TB hard drive; nVidia Quadro K3100M with 4GB RAM; 27in (2560x1440) IPS display; 1080p camera; gigabit ethernet; Thunderbolt 2; 5.1-channel analogue audio; S/PDIF digital audio; 2x USB 3.0, 4x USB 2.0, 1x DisplayPort 1.1; 528x660x419mm; 21.3kg

Build: ★★★★★☆

Features: ★★★★★☆

Performance: ★★★★★☆

Value: ★★★★★☆



ALL IN ONE

HP Z1 G2

The HP Z1 G2 is a unique computer. All-in-ones – computers that combine the screen and desktop components into a single slimmish unit – are two a penny, with Apple's iMac being the best known.

It would be very easy to talk down the Z1 G2's design, as it's much bulkier than the 27in iMac, but it's not better or worse, it's different. Which appeals is a matter of taste. The iMac's design says grace, the Z1's says power. The iMac is stripped back, the Z1 has everything (including some superfluous things such as the option of a DVD drive, if you don't want Thunderbolt).

The Z1 is much bigger, but it's more powerful and upgradeable, too. It feels – and is – heavy. Even tilting the screen gives your arms a workout, and constructing the thing when you first get it out the box is best done with a friend. Muscle ache aside though, there's something satisfying about this solidity.

Push the screen over to lie flat and push two latches, and the whole screen swings back to let you into the Z1's chest cavity to quickly replace anything that's died or upgrade with newer/bigger parts. Try doing that with an iMac. It's a neat piece of design, and – while we've got a sneaking suspicion that after the initial fun of showing it off to people had worn off, we'd need to do this very rarely – in emergency it'll be very useful indeed.

By not attempting to make the Z1 G2 as thin as the iMac, HP has had no trouble dotting ports around the sides of its main body, so plugging in portable things such as storage, USB keys and your phone is a doddle.

The 'beating heart' of the Z1 G2 is either an Intel Xeon E3, Core i3, i5 or i7 processor – which is the unusual for a workstation. Most other workstations from the likes of Dell, HP and Lenovo have Xeon processors, with Core-based models being from less well-known brands. Choosing a Xeon gets you the best performance – as you can select the 3.7GHz Xeon E3-1281v3 – and reliability, while choosing a Core i7 will keep the cost down. The Core i5 and i3 are for people who care less about performance in creative apps, those in the financial industries, for example.



Our review unit came with the second-most powerful chip option, the quad-core 3.4GHz E3-1246v3.

It also has the maximum 32GB of RAM – which is good for now but hardly futureproof – and an 3.4GHz E3-1246v3. If you want more or less graphics power you can plump for the K4100M (also 4GB, but more oomph) or the K2100M (2GB). Ignore the choice of chips below this, again they're not for you.

For storage, you can put in either a single 3.5in or two 2.5in drives, plus an additional M-SATA drive. Our review unit had a 256GB M-SATA system drive, plus a 1TB hard drive for project files.

Other configuration options include a touchscreen – though this lacks proper pen support, so it's not a rival to a desktop attached to a Wacom Cintiq. Our review unit didn't have this. There's also a slot where you can have either a Thunderbolt 2 card with two ports or a DVD drive – depending on whether you're looking to the future or are still stuck in the past.

The Z1's screen is it's weakness. It's a good display that's many creatives would be very happy with, but it's not great like the iMac's. HP's Dreamcolor pro-level monitor line as uses the same 'Z' branding as the Z1, so you'd expect the screen to be as good as one of those – but again the Z1 falls short.

First off, it has the same 2560x1440 resolution as the Dreamcolor Z27x monitor, but the

level of detail is half that of the 5120x2880 5K iMac.

We tested the Z1 using our standard testing tool, DataColor's Spyder4Elite colourimeter and software. It found the Z1 to have a smaller colour gamut – the breadth of different shades the screen can output – than the 5K iMac or the Dreamcolor Z27x. The Z1 could output 75 percent of Adobe RGB colour space used by all of that company's applications, against 78 percent for the iMac and 87 percent for the Z27x.

The Z1's accuracy was excellent though, and certainly on a par with both of its rivals.

Upgradability

Popping open the G2's hood gives you easy access to replace and upgrade components.

Replacing the media drive is easy, as is the RAM, though, but you can't add more than the 32GB that our test unit already had.

One component that's trickier to replace is the graphics, as it uses a laptop-style MXM connector. You should be able to get replacement parts, but future upgrades are unlikely to be possible.

Verdict

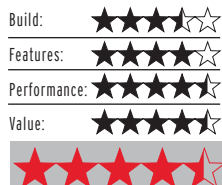
The HP Z1 G2 is an excellent iMac alternative if you prize power over beauty or screen quality, though, we're still not convinced most people wouldn't be better off with a desktop workstation. **Neil Bennett**

£57.50 ex VAT
£91 inc VAT

Contact
■ hp.com/uk

Specifications

Mono laser; Max print resolution 1200- and 2400dpi; quoted print speed B=25ppm; actual print speed B=22.2ppm; supported interface types USB 2.0, ethernet, Wi-Fi 802.11b/g/n; mobile device support; 250-sheet main input; 1-sheet manual feed; auto duplex; 379x293x243mm; 7kg; toner cost B=£42; print life (pages) B=2100; 1-year warranty



MONO LASER PRINTER

Canon i-Sensys LBP6230dw

Gone are the days when a single laser printer seemed large enough to power a small village. There are still some gargantuan models available, but in 2015 it's possible to have the magic of laser technology and still preserve much of your desk or floor space. The LBP6230dw is a case in point. It might look rather cumbersome on the page, but in the flesh it's pleasingly discreet, with a 379x293mm footprint sufficiently modest to be hidden away on most desktops. Its grey/cream colour combo is standard-issue office fare, allowing it to blend in nicely with the rest of the equipment. The Canon, then, is a laser that you can set up and forget about.

Not that everything is perfect. Open the paper tray, and the printer has a distinctly unfinished look, as though it had escaped from Canon's factory before it could have the final touches applied. As it turns out, this first impression is rather misleading, and there's a hidden tray cover that pulls out to create a full 250-sheet holder. We miss the extra security that comes from the meaty moulded trays built into the bigger and more expensive models, but it's still a very clever space-saving design. And built into the top is a one-sheet manual feed, which gives you the option to run off media of a very different type without having to fiddle around with the main tray. The output tray is shallow, and its 100-sheet capacity may be a slight limit. But if you want a laser this small, you'll likely have to put up with this minor problem.

Easy to use

One area the Canon doesn't excel in is user-friendliness. For a start, there's a rather arcane setup process that involves removing various pieces of safety plastic. We're used to extracting these, of course, but the Canon seems to delight in hiding them away as much as possible. And the diagrammatic instructions aren't as useful as they might be. A better guide is available in HTML online, but we miss the days of full printed documentation.

The control panel itself isn't much easier to grasp. Three lights and four buttons (five if you count the rear-mounted reset switch) are plastered across the printer. But the



actual use of these isn't so clear.

And the 'on' switch is located at the front rather than in the more natural-seeming position of the top of the Canon. For the most part, you won't need to deal with many of these keys - they allow you to cancel jobs, restart after paper issues, or set up the Wi-Fi. As with most lasers and business models, the LBP6230dw lacks warmth.

Connectivity can still be an issue for small to medium offices. Ethernet remains the most workable solution for the typical office. But Wi-Fi offers increased flexibility, even if at the expense of speed and reliability. Whatever your firm's setup, the Canon slots perfectly in, touting both ethernet and the wireless 802.11b/g/n. There's no Bluetooth support, but this is very much a niche product in today's business world. There's no support, either, for memory cards, although you can hook up to the Canon through mobile devices.

Performance


And so to performance. 64MB of RAM is built in, so the Canon should be able to handle sizeable tasks. It's quoted for 25 pages per minute. We couldn't squeeze out more than 22.2ppm, but this is close enough to make it a smart performer for the money. In contrast, the Samsung Xpress M2070W could manage just 17.1ppm. Even A4 graphic images could be produced at a faster rate of 17.7ppm on the Canon. It's also strong when it comes to automatic duplexing - turned on by default to save paper - and the Canon's

speed of 22.2ppm fell to a still very respectable 14.9ppm. This remains more than fast enough for auto duplexing to be seen as a standard option rather than a feature to be saved for occasional use.

Text quality is very good for the price. Characters are immaculately defined, and reasonably dark - even if not jet black. You can make out detail even at small sizes, while graphics (mono A4 prints come out at a rate of 17ppm) offer strong greyscale depth with no defects.

Given such excellent performance for the price, you might expect its toner costs to provide a sting in the tail. However, Canon's black 726 toner cartridge (priced £42) offers 2100 pages in total, giving it a cost per page of 2p. This allows it to easily outperform the likes of the Brother MFC-J870DW (2.6p). If you want value, the Canon excels here, too.

Verdict

We haven't been overly effusive about every aspect of this printer. However, many of the LBP6230dw's faults are common to most other affordable laser printers. And many of them are minor issues that will cause few problems on an everyday basis. And there is a lot, an awful lot, that the Canon does incredibly well. It's highly affordable to both buy and run, and has searing speed and quality for this price-point. It's also pleasingly compact. For a discreet page-churner that you can entrust your daily workload to, it's a fantastic product.  **Robin Morris**

MID-PRICE

GAMING PCS

If you're willing to push the boat out a little, you can add a whole new dimension to games with superior graphics and an all-round performance boost. **Paul Monckton** reviews six mid-price models

Consoles are great, but they simply can't match the graphical power of a decent gaming PC. With the right processor and graphics card, you can achieve far higher-quality visuals and enjoy all the game modifications you desire. Of course, you also get high performance for all your non-gaming needs and that graphics card will also offer a considerable performance boost to other applications, such as photo and video editing software.

Processor

Different games place different demands on your computer hardware, but choosing a gaming PC involves a balancing act between CPU and graphics performance.

For gaming PCs we're happy to allow overclocked processors, which will significantly increase your overall processing power without having to stump up for the most expensive chips. Five out of our six review systems are using Intel's quad-core Core i5-4690K processor, with the sixth using the standard non-overclockable version of the same chip.

Nominally this chip runs at 3.5GHz, but with the right power and cooling this can be pushed much further – as far as 4.6GHz in the Case of Dino PC's Spark GTX 960. The Core i5-4690K is a great starting point for a gaming PC and there's not usually much to be gained from upgrading to a Core i7.

Overclocked processors place additional demands on the system's power supply and also require better cooling, so expect to pay more for PCs with extreme overclocking.

Motherboard

There are several points to consider when choosing the right motherboard for your PC. If you're not into technical details, you may be tempted to overlook the motherboard and concentrate on the processor and graphics, but the motherboard is equally important.

If you want to keep costs down, you can go for an Intel H81 Express chipset. These boards will cost significantly less than premium motherboards based on the enthusiast Z97 chipset, but come with reduced features. Crucially, the H81 Express chipset doesn't officially support processor overclocking, but the feature has been independently enabled by many motherboard vendors and work just fine.

Opting for a lower-cost motherboard can also allow you to spend a little more on your graphics card, which can have a big impact on your final performance figures.

This option is not without risk. Although your warranty protects you from system failures due to overclocking, it's theoretically possible for Intel to pull the plug and put pressure on vendors to remove the overclocking features in forthcoming BIOS updates. Similarly, Windows Update could also be used to install new processor microcode with the same effect.

The Z97 Express chipset brings many extra features, including more USB 3.0 and SATA ports, support for Intel Smart Response Technology, RAID and PCI-E M.2 SSDs.

Graphics card

It's usually the graphics card that will determine the overall quality of your gaming experience. Once your processor is fast enough, it's down to the graphics card to deliver the game to your screen.

To ensure smooth gameplay, you generally want to achieve a minimum of 60 frames per second (fps) in your game. This is the limiting speed of most PC displays, so you won't really need to go faster than this unless you have a high-speed gaming monitor that allows for faster refresh rates.

Any extra performance will then allow you to increase the quality settings in your game, making characters sharper, textures more realistic and graphical effects more

immersive. NVidia's new GeForce GTX 960 offers an excellent balance of price and performance at this price range and features in four out of six of the PCs in this group test. Another great performer is AMD's Radeon R9 285 DD Edition, which edged just ahead of the GTX 960 in most of our tests.

If you need more power, you may be able to fit a GeForce GTX 970 within a £1,000 budget, although you might have to make some cuts elsewhere. This would give you twice as much on-board memory for textures and multi-screen use, as well as a significant boost in performance at the higher quality settings.

Don't worry too much about choosing between AMD and nVidia. As is usually the case, it's down to which graphics card vendor has done a better job optimising any particular game for performance on its own cards. If you have an idea of which games you want to play, it can be worth investigating how well any given card performs with those particular games before you make your decision.

Cooling

Cooling is essential if any CPU is not to overheat, but especially one that's been overclocked. The basic Intel CPU cooler vendors often fit will save you money, but it can be noisy and won't keep your processor as cool, and will need careful attention paid to airflow through the case.

Expensive water cooling systems allow for extreme overclocking, but more modest budgets will generally allow for a smaller, sealed liquid-based coolers such as the Corsair Hxx range. Alternatively, you can go for a heat-pipe based cooler, which will give better cooling than a standard model while making less noise, thanks to larger, slower-moving fans.

Gamers like their systems to look the part, but the case needs to be practical. Internal



Photography by Dominik Tomaszewski

cable management aids airflow, while fan controllers let you reduce noise or boost cooling as necessary.

Graphics cards can also come with various cooling systems, the more advanced of which can allow for faster clock speeds on the GPU and less noise from the graphics subsystem when playing games.

Monitor

For more immersive gameplay, go for the largest display you can find and one with a good contrast ratio. A fast response time will ensure that fast, frenetic gameplay remains free of blur, although not all game players will notice any difference. TN-based monitors will cost less and provide most of these features, but IPS-based displays will give you better overall colour reproduction and wider viewing angles, although response times tend to be slower. For a more responsive display, go for a gaming monitor with a high refresh rate of 120- or 144Hz, although you'll need powerful graphics to supply frames at this speed. For the very smoothest gameplay from an nVidia graphics card, look for a monitor that supports nVidia G-Sync. With G-Sync, the monitor stays in step with the graphics

card rather than the other way around. This means less blurring or image tearing even at lower framerates, and will be of great benefit to mid-range graphics cards such as the ones found in these PCs. AMD offers a competing technology called 'FreeSync', which will soon be available for displays connected to AMD graphics cards.

Peripherals

If you're using your PC on a desk with a monitor, you'll benefit from the improved responsiveness of wired rather than wireless devices. Look for high-resolution mice, and keyboards with programmable keys and backlighting.

High-grade mechanical switches in keyboards have a better 'feel' and provide longer life than cheap membrane switches. Some draw attention to the W, A, S and D keys with a different colour or texture. A gaming sound card can provide a more immersive experience by adding multiple sound effects, with improved audio fidelity. Also consider a gaming headset with a built-in mic.

However, if you're planning on playing from the sofa, you'll want wireless controllers. For keyboard input, we would

recommend a wireless model that comes with an integrated pointing device, such as a trackball or trackpad.

Most of the PCs in this group test come without internal optical drives, and those built into the NZXT Source 340 system case lack the drive bays necessary to install them. In these cases, consider adding an external USB DVD or Blu-ray drive. This time, Vibox has included one in the price of the system.

Power consumption and noise

If you're using the PC as a home entertainment hub, you may also want to consider idle power consumption and noise. The more you overclock your PC, the more power it will consume and the louder it will become.

Warranty

Warranty terms are crucial when it comes to gaming PCs and a key advantage of buying a pre-built overclocked PC is that all of the overclocking will be tested and covered by the vendor's warranty. The longer the warranty the better, but also look for a collect-and-return rather than return-to-base option. Also pay attention to whether parts and labour are both covered and for how long.

CHILLBLAST FUSION MANTIS

£749 inc VAT • chillblast.com

Chillblast's Fusion Mantis may be the least expensive option here, but it doesn't skimp on build-quality or performance. Much of the cost saving comes from the fact that it ships as a base-unit only, to which you would be adding your own monitor and peripherals.

It has a NZXT Source 340 system case, which offers a very clean, minimalist, design with an entirely featureless front panel, lending the PC a more expensive feel. This is possible because the case has no front drive bays, and therefore no internal optical drive. It also features a transparent side window, which starts part way up the side of the case, thereby blocking most of the internal cabling from view. The Fusion Mantis is therefore very tidy inside and the use of a Corsair H55 liquid-based CPU cooler assists creates extra space inside, which also helps with airflow through the case.

The CPU in question is an Intel Core i5-4690K quad-core processor, which is perfect for this type of gaming PC, thanks to its stellar performance and overclocking capabilities. Chillblast has pushed the 3.5GHz chip to 4.2GHz in this system, which is less ambitious than much of the competition but enough to give a noticeable boost to overall performance and ensure high frame rates. A 2GB nVidia GeForce GTX 960 graphics card does all the heavy lifting when it comes to gaming.

The Fusion Mantis comes with 8GB of RAM as standard and comes with a couple of spare slots ready for a user upgrade to 16GB. You might also like to upgrade the 1TB Seagate SSHD hybrid drive, by adding a discrete SSD to boost performance and perhaps replacing the SSHD with a standard hard drive of a larger capacity.

Build	★★★★★
Features	★★★★☆
Performance	★★★★★
Value	★★★★★
Overall	★★★★★



The system is built around a Gigabyte Z97HD3 motherboard, which comes with Intel's premium Z97-Express chipset, rather than the less featured HD81 Express chip that's often found in gaming PCs.

Gaming scores are very respectable, with most scores near or above 60fps, so long as you steer clear of 'Ultra' quality modes. You could spend extra on a more powerful graphics card, but you would have to spend significantly more to reach playable speeds at 1080p with everything on maximum.

VERDICT: The Chillblast offers great value for money and competitive performance, though you'll need your own monitor and peripherals.

CYBERPOWER INFINITY ACHILLES PRO GT

£999 inc VAT • cyberpowersystem.co.uk

The Infinity Achilles Pro GT is a complete gaming system, including a powerful PC, dedicated gaming peripherals and a 24in monitor. NZXT's Source 340 system case lends the PC a bold, minimalist look with a transparent side panel, and a front panel that eschews optical drives entirely, leaving it completely blank.

Inside there's 8GB of 1866MHz DDR3 memory, a 1TB hard drive and a 12GB SSD to increase responsiveness, speed up boot times and accelerate game loading.

Like most gaming PCs in this price range, it has a speedy Intel quad-core Core i5-4690K 3.5GHz processor. However, the Infinity Achilles Pro GT also comes with a very specific weak spot: the processor hasn't been overclocked. Our benchmark results therefore show no benefit from the use of the overclockable 'K' version of the Core-i5, which costs slightly more than the standard version as seen in Scan's 3XS Gamer PC. Consequently, the Cyberpower turned in the slowest overall benchmark results here.

Motherboards based on the Intel H81 Express chipset, such as the Gigabyte H81M-S2H model chosen by Cyberpower, don't list overclocking among their features, but many of them do support the feature in a semi-official way. This means there's a good chance you'll be able to overclock this PC yourself if you wish, although we would always advise buying a pre-overclocked system instead, which would be covered by a manufacturer's warranty.

While this PC lags behind in most benchmarks, it has a secret weapon in the form of a 4GB nVidia GeForce GTX 970 graphics card, which brings with it a major performance boost for gaming. It's enough to enable the use of 'Ultra' quality settings where most of the

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★☆
Overall	★★★★★



competition would have to settle for 'high' quality. The 4GB of on-board memory also allows for the highest quality textures to be used, again making a noticeably improvement to graphics quality.

The PC is supplied with a 24in AOC monitor, with a fast 5ms response time and the illuminated gaming keyboard and mouse combo from Cooler Master completes the system.

VERDICT: The Cyberpower Infinity Achilles Pro GT is simultaneously the slowest and fastest PC in our group test. The non-overclocked processor places it at a disadvantage for applications, but the nVidia GeForce GTX 970 graphics card helps it scream ahead for gaming.

DINO PC DARK SPARK GTX 960**£999** inc VAT • dinopc.com

The Dark Spark GTX 960 is a complete PC package, bundled with all the peripherals you will need for an exciting gaming experience.

Based on Intel's quad-core Core i5-4960K, overclocked from the standard 3.5GHz to an ambitious 4.6GHz, the Dark Spark achieves the fastest processor top speed in our mid-priced PC group test. To keep CPU temperatures in check, Dino PC has selected a Be Quiet Pure Rock BK009 processor cooler, which has a quiet nine-blade 120mm fan and six heat pipes.

Graphics power comes from a Palit-branded nVidia GeForce GTX960 with 2GB of RAM. Our gaming tests don't benefit much from the boosted CPU performance, but more processor-intensive games such as Dragon Age Inquisition stand to see increased frame rates.

Storage comes in the form of two drives: A 120GB Samsung 850 EVO for fast booting and quick load times, and a separate 1TB hard drive for increased storage. A 120GB drive is enough to hold a Windows installation, but any sizeable game collection is likely to be forced onto the slower hard drive. We would recommend going for a larger SSD if your budget allows. The system also comes with 8GB of RAM, which is adequate, and easily upgradable to 16GB later.

At the centre of the system is a Gigabyte Z97X-Gaming 3 motherboard, which uses Intel's Z79-Express chipset. This particular model also includes enhanced quality audio and a built-in amplifier for rear surround speakers and supports multi-card graphics setups from both AMD and nVidia, allowing flexible upgrade options.

Dino PC has chosen NZXT's new Source 340 system case. It has no external drive bays, and presents a blank front panel, while the



side window obscures most of the cabling at the bottom, leaving a clean view of the more visually interesting components above.

The Dark Spark GTX 960 comes with a Corsair Raptor HS30 gaming headset, the Corsair Raptor K30 keyboard, and a Corsair Raptor M30 high-dpi gaming mouse. A 24in Iiyama ProLite GE2488HS-B1 monitor is also included. Its TN panel is built for speed rather than colour accuracy, but it's ideal for fast-paced gaming thanks to its 1ms response time.

VERDICT: Dino PC's Dark Spark GTX 960 is an excellent, well-rounded gaming PC with all the peripherals you'll need to start playing.

ECLIPSE SUPERNOVA i5R2850C**£999** inc VAT • eclipsecomputers.com

Eclipse's rather imposing SuperNova i5r2850c is for gamers who want a PC that looks as impressive as it plays. Housed in the huge XFX Type 1 Bravo case, this system dwarfed every other in our testing lab and drew a few surprised looks.

There are some pretty impressive components inside, too. A quad-core Intel Core i5-4690K is in full-effect, being overclocked from 3.5- to 4.4GHz and chilled by a Zalman CNPS11X Extreme cooler. It's a beast of a cooler, with twin heat sinks in a v-formation and fitted with an illuminated fan. There's co-ordinated red and black styling throughout the system, including the Eclipse logo, the large XFX badge on the side of the case, and the red heat spreaders on the generous 16GB of HyperX Savage 2133MHz memory.

Graphics are provided by an AMD-powered Radeon R9 285 DD Edition graphics card with 2GB of memory. Storage consists of a 250GB Crucial BX100 SSD and a 2TB Seagate Barracuda hard drive, giving you both speed and huge capacity.

Eclipse has selected a premium Z97 Express-based motherboard in the form of the Asus Z97-K, which supports Intel RAID, up to six USB 3.0 ports and dual graphics cards.

This configuration delivers excellent performance, achieving a PCMark 8 2.0 Home score of 5446 points. In the remaining PC Mark 8.0 2.0 tests the SuperNova i5r2850c performs even better, pulling ahead of the competition by a significant margin. For example, its PC Mark 8 2.0 Creative score of 7,498 points is over 1,200 points faster than its nearest rival in our group test.

Cyberpower's Infinity Achilles Pro GT delivers a much faster gaming experience than the Eclipse, but not without major cutbacks



in other areas. If gaming speeds are your ultimate goal, then you may be better served by the Cyberpower, but as a well-rounded high-performance system this example from Eclipse is very hard to beat.

Included with the system is a 26in HKC 1080p monitor with a TN panel and a 5ms response time ideal for blur-free gaming. It also comes with a Cooler Master Storm Devastator gaming keyboard and mouse set. These both have angular gamer-friendly looks.

VERDICT: The SuperNova i5r2850c, is huge and imposing. It also blows away the competition in terms of application performance and is available as a base-unit only for a very competitive price.

SCAN 3XS GAMER

£899 inc VAT • scan.co.uk

The 3XS Gamer from Scan looks, externally, almost identical to several other gaming PCs in this group test. Inside, it's teamed up an nVidia GeForce GTX 960 graphics card with an Intel Core i5-4690 CPU. The difference here is the inclusion of the standard version of this CPU rather than the overclockable 'K' version.

This has resulted in rather less impressive overall system speeds than similar PCs with overclocked chips. However, the graphics card ensures that in a large proportion of games, the 3XS Gamer will be able to keep up the pace, but if you play games that benefit from a lot of CPU power, this probably isn't the system for you. In our tests, the 3XS Gamer proved capable of gaming at 1080p with mid- to high-level quality settings, which is great for a PC at this price.

The 3XS Gamer has been designed specifically with gaming in mind and includes Asus's SupremeFX audio components, which have been electromagnetically shielded to help ensure better sound quality, as well as beefed-up audio capacitors and a powerful headphone amplifier.

The system comes with 8GB of 1600MHz DDR3 memory and storage is provided by a speedy 240GB Kingston SSDNow V300 SSD.

Build	★★★★★
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆



Unfortunately, that's all the storage you get. We'd definitely urge you to add a hard drive to the specification before purchasing this PC.

VERDICT: Scan's 3XS Gamer appears at first glance to be a good deal, but the lack of overclocking puts it at a significant performance disadvantage against the competition.

	CHILLBLAST £749 inc VAT (£624 ex VAT) ★★★★★	CYBERPOWER £999 inc VAT (£832 ex VAT) ★★★★★	DINO PC £999 inc VAT (£832 ex VAT) ★★★★★ PC ADVISOR RECOMMENDED
Product name	Fusion Mantis	Infinity Achilles Pro GT	Dark Spark GTX 960
Processor	3.5GHz Intel Core i5-4690K (4.2GHz)	3.5GHz Intel Core i5-4690K	Intel i5 4690k 3.5GHz (4.6GHz)
CPU Cooler	Corsair H55 Water Cooler	Cooler Master Seidon 120mm RL-S12M-FLNN-S1	Be Quiet Pure Rock BK009
RAM	8GB DDR3 1600MHz	8GB DDR3 1866MHZ	8GB DDR3 1600MHZ
Storage	1TB Seagate SSHD Hybrid Drive	Kingston V300 120GB SSD, 1TB Seagate SATA III ST1000DM003	Samsung SSD 850 EVO 120 GB, 1TB Hard Drive
Power supply	Corsair CX 600 600W PSU	Cooler Master B600 600W RS600-ACABB1-UK	Corsair VS 450W
Motherboard	Gigabyte Z97-HD3 Motherboard	Gigabyte H81M-S2H	Gigabyte Z97X-Gaming 3
Operating system	Windows 8.1 (64-bit)	Windows 8.1	Windows 8.1
Graphics	MSI GeForce GTX 960 (2GB)	MSI nVidia GTX 970 (4GB)	Palit nVidia GeForce GTX 960 OC (2GB)
USB ports	6x USB 3.0, 2x USB 2.0	6x USB 3.0, 3x USB 2.0	6x USB 3.0, 4x USB 2.0
Other ports	2x DVI, HDMI, DisplayPort, PS/2	2x DVI, HDMI, DisplayPort	Motherboard: 2x PS/2, 1x D-Sub, 1x DVI-D, 6x SATA 3, 1x SATA Express
Display	None	AOC E2470SWDA LED 5MS VGA (24in)	Iiyama GE2488HS-B1, (24in, 1920x1080)
Optical drive	None	None	None
Case	NZXT Source 340	NZXT Source 340 Black	NZXT Source 340
Keyboard & Mouse	None	Cooler Master Devastator	Corsair
Warranty	5 years labour, 2 years C&R	2 years parts, 3 years labour RTB, 30 days C&R	3 years PromoCare
PERFORMANCE			
PCMark 7 overall	5823	5945	7090
PCMark 8 home	5178	4663	5448
PCMark 8 work	5132	4924	4960
Games score (fps) ¹	104.2/55.2, 289.3/123.8/29, 86	167.8/89, 281.1/192.9/48.1, 120	103.4/54.7, 285.6/123.6/28.9, 86
Power consumption ²	50/277W	48/261W	77/310W

¹Games tested: Alien vs Predator 720p/1080p, Max; Sniper Elite V2 Low/720p/1080p, Med; Final Fantasy XIV 1080p Max ²Measured when idle and under load respectively

VIBOX WILDFIRE**£999 inc VAT • vibox.co.uk**

Coming in at just under £1,000, the Vibox Wildfire is a complete overclocked PC gaming system. It uses a quad-core Intel Core i5-4690K processor. This particular example has been overclocked from the standard 3.5- up to 4.4GHz, delivering a considerable boost to general system performance.

The case in question is an NZXT H440 in bright red, and has a blank front panel with no external drive bays. Vibox has therefore included an external USB DVD burner, which can be plugged in as necessary. Inside, the H440 includes excellent cable management features and comes with dust filters fitted as standard.

The Vibox Wildfire also includes 16GB of Kingston Hyper-X Beast DDR3 memory running at 2400MHz - by far the fastest memory speeds of any achieved in this group test. This is backed by a large 240GB Kingston V300 SSD, which offers enough space to house the Windows operating system along with a full collection of games. A 1TB hard drive is also included for bulk storage. At the heart of the PC is MSI's Z97 Gaming 3 motherboard, featuring an Intel Z79 Express chipset and enhanced quality audio outputs incorporating a headphone amplifier. The Wildfire comes with a 23.6in

Build	★★★★★
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆



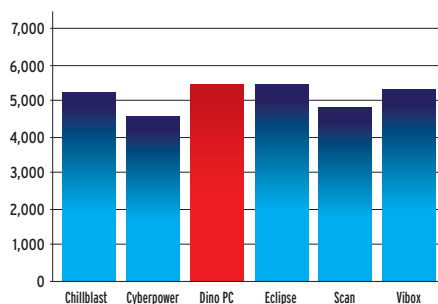
AOC monitor with a fast TN panel. Also supplied is the Cooler Master Devastator keyboard and mouse bundle.

VERDICT: The Vibox Wildfire is a well-balanced PC that delivers solid performance and has all the peripherals you'll need. However, the one-year warranty is short compared to its rivals.

ECLIPSE £999 inc VAT (£832 ex VAT) ★★★★★ PC ADVISOR RECOMMENDED	SCAN £899 inc VAT (£749 ex VAT) ★★★★★ PC ADVISOR RECOMMENDED	VIBOX £999 inc VAT (£832 ex VAT) ★★★★★ PC ADVISOR RECOMMENDED
SuperNova i5r285oc	3XS Gamer	Wildfire
3.5GHz Intel Core i5-4690K (4.4GHz)	3.5GHz Intel Core i5 4690	3.5GHz Intel Core i5-4690K (4.4GHz)
Zalman CNPS11X Extreme	Arctic Cooler Freezer 11 LP	Corsair H75 AIO CPU Cooler
16GB HyperX Savage 2133MHz	8GB Corsair Vengeance DDR3 1600MHz	16GB Kingston Hyper-X Beast DDR3 2400MHz
2TB Seagate Barracuda HDD, 250GB Crucial BX100 SSD	240GB Kingston SSDNow V300 SSD	240GB Kingston V300 SSD/1TB Mechanical HDD
XFX 550W Core Edition 80+ Bronze	Corsair VS 550W	Superflower Golden Green HX650w Gold Rated
Asus Z97-K	Asus H81 Gamer	MSI Z97 Gaming 3
Windows 8.1	Windows 8.1 (64-bit)	Windows 8.1
XFX AMD Radeon R9 285 DD Edition (2GB)	EVGA nVidia GeForce GTX 960 (2GB)	MSI GeForce GTX 960 Gaming (2GB)
6x USB 3.0, 4x USB 2.0	4x USB 3.0, 4x USB 2.0	4x USB 3.0, 2x USB 2.0
2x DVI, 1x HDMI, DisplayPort	DVI, HDMI, 3x DisplayPort	1x VGA, 1x DVI, 1x HDMI, 1x DP, 6x OFC audio jacks, 1x optical
HKC 2615 (26in, 1920x1080)	None	AOC E2470SWDA (26in, 1920x1080)
Samsung DVD ± RW	None	External USB DVD ± RW
XFX Type 1 Bravo	NZXT Source 340	NZXT H440 Red
Cooler Master Storm Devastator	None	Cooler Master Devastator
3 years RTB	1 year on-site, 2 years RTB	1-year parts and labour, 90-day C&R
7931	6635	7095
5446	4866	5293
5424	4968	5176
111.4/59.8, 292.1/106.8/26.5, 91	104.3/55.6, 282.9/124.4/29.2, 87	113.5/59.7, 316.8/136.2/31.9, 95
76/432W	40/250W	69/307W

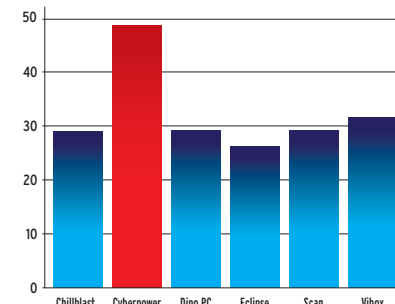
OVERALL SYSTEM PERFORMANCE

PCMark 8 Home (points)



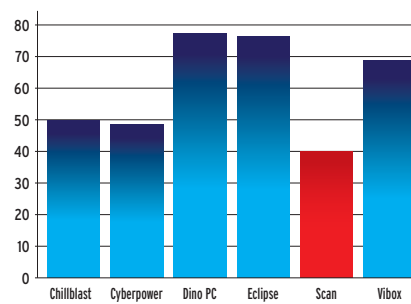
GRAPHICS PERFORMANCE

Sniper Elite 2, 1080p (fps)



POWER EFFICIENCY

Idle power consumption (Watts)



Conclusion

While there are a great many similarities between most of these mid-price gaming PCs, there are still a few options available.

If gaming frame rates mean more to you than anything else, then Cyberpower's Infinity Achilles Pro GT has the edge, its nVidia GeForce GTX 970 leaving all challengers in its dust. If this system had been overclocked, it would have been a force to be reckoned with.

Scan's 3XS Gamer is reasonably priced, but performance suffers due to the lack of overclocking. Also, with only a 240GB SSD for storage, we feel that most users are simply going to run out of disk space.

Chillblast's Fusion Mantis offers a modest overclock to 4.2GHz and delivers middle-of-the-road performance, but with very lower power consumption and a decent Z97 Express-based motherboard. Most importantly, it costs only £749.

Dino PC, Eclipse and Vibox have all delivered great full-package systems featuring overclocked processors, monitors and peripherals. The most overclocked, and more generously equipped in terms of accessories, is Dino PC's Dark Spark GTX 960.

Eclipse's SuperNova i5r2850d has that beast of a system case, which looks very impressive and the PC delivers great

performance too. If you plan on installing many upgrades later or prefer AMD-based graphics, this could be the system for you.

The Vibox Wildfire is a well-balanced system, with all the peripherals you'll need, a decent amount of overclocking and super-fast memory chips. It can't match the gaming speed of Cyberpower's Infinity, but it comes out a few frames per second ahead of the other systems using the nVidia GeForce GTX 960 card also selected by Vibox. If only that one-year warranty had been longer – it seems stingy when compared to the three-year standard warranties offered by Cyberpower and Eclipse.

How we test

With this budget gaming PC group test, we've started testing with Futuremark's PCMark 8 v2.0 benchmarking suite. Unlike the previous PCMark 7 benchmark, the new version doesn't produce a single overall figure. Instead, results are divided into Home, Creative, Work and Storage tests.

The Home benchmark reflects command tasks for typical home use with lower computing requirements such as web browsing, photo editing and low-end gaming.

The Creative benchmark is aimed more at enthusiasts and professionals working with multimedia and entertainment content. It is more demanding on the processor and includes transcoding tests, as well as further gaming workloads.

The Work test is geared towards office work tasks like creating documents, web browsing, spreadsheets and video conferencing. This test does not stress the gaming and multimedia capabilities of the PCs in this group test.

Gaming performance

We've used three games to evaluate graphics performance. We run our tests at 1280x720-

and 1920x1080 pixels at various detail settings. Framerates are recorded using the following games and quality settings.

Final Fantasy XIV: 1280x720, Medium quality; 1920x1080, Maximum quality.

Alien vs Predator: 1280x720, all settings at Maximum quality; 1920x1080, all settings at Maximum quality.

Sniper Elite V2: 1280x720, all options set to Low quality, advanced shadows off, Supersampling off; 1920x1080, All options set to Medium quality, advanced shadows off, Supersampling off; 1920x080, all options set to Ultra quality, Advanced shadows - high, 4x Supersampling.

Power consumption torture testing

We measure the power consumption of each PC base unit when idle, and again while running at its performance limit. During the idle test, the PCs hard drives are still spinning and the power-management features are not enabled. For the full-load torture test, we run Prime 95 to force all CPU processing threads to maximum utilisation and stress system memory. At the same time we run the Geeks3D FurMark

benchmark to stress any installed graphics cards. We leave these tests running for 10 minutes, then record the power consumption and the CPU temperature reached.

Overclocking

Because gamers demand the best performance from their hardware, we allow vendors to overclock PCs in this category. We require that any tweaked component is designed for overclocking, and that the PC vendor offers a comprehensive warranty.

Subjective assessment

We pay close attention to the physical characteristics of each PC, its noise output and its build quality, delving inside the case and taking note of the quality of components used, cabling and airflow.

Support

Differences in warranty terms can impact our scoring. Long warranties are sought after, but we also look at the terms and conditions – specifically, whether faulty PCs must be returned to the vendor at your cost and if both parts and labour are included. ☒

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Flying high

Drones are all the rage at the moment, but the sheer amount of choice, as well as the huge range of prices can make it difficult to know what to buy. **Jim Martin** looks at six of the latest flying machines

Drones are known by many names, including quadcopters, mini-quads, multi-rotor craft and more. Most commonly they have four rotors but vary in their size, price and features. Their huge popularity means there's a wide range of models to choose from. Here we explain what you need to know about buying a drone, and review the best quadcopters for all budgets.

Price

At the entry level, mini-quads start at just £10, but you won't get a camera unless you pay around £50. Increase your budget towards £100 and you should expect to get live video (first-person view) on your smartphone via a free app, or even a colour screen on the remote control. The Revell X-Spy, for example, costs £80 online and has a mount above the remote control for holding your smartphone.

At higher prices, you get more for your money. As well as longer flight times drones should also have better on-board processing to help with flying. For example, both the Parrot AR.Drone Elite Edition and DJI Phantom 2 Vision+ 3.0 can hover in one spot, whereas cheaper drones require you to be constantly adjusting the controls just to maintain position in the air.

Cameras

Not all drones come with cameras. You don't need one, since you should always have the drone in your line of sight while flying. Even if a drone has a camera, it may not offer FPV (a real-time video stream), which you need in order to fly it without line-of-sight.

At the cheaper end of the price scale you'll be lucky to get even VGA video, but it's worth opting for at least 720p (1280x720) if you want a drone for aerial video. Bear in mind that – as ever – you can't trust specs alone. One 720p camera may shoot detailed footage while another looks more like CCTV from the 1980s.

However, you'll only get great quality footage if you buy a drone with a gimbal. This is a gyro-stabilised mount for the camera, which keeps it steady when the drone tilts or moves around. They don't come cheap, though.

Some cameras record video directly to a microSD card (or USB drive), but others record from the remote control, or even directly to a smartphone. Direct recording is usually more reliable and better quality.

Flight- and charging time

Typically, you can expect between five- and 15 minutes of flight time between charges, which themselves take around an hour. It's a

shame more companies don't supply multiple batteries, as you'll need one or two spares.

You should also budget for a couple of sets of rechargeable AA batteries as most controllers take four of them, and those with live video screens will burn through a set of alkaline batteries in under an hour.

Range and where to fly

Although some manufacturers claim a range of over 100m, it's best to assume you'll never get more than about 50m. By law in the UK, you must keep the 'unmanned aircraft' in your line of sight at all times, anyway.

Realistically, you can't easily fly a quadcopter in your home. The rooms are too small and the rotors can be dangerous to people and pets. Plus, pets and children are scared by them. Only the tiniest models – such as the Hubsan FPV X4 and Revell X-Spy can really be flown in small spaces.

Even a garden is likely to be too limited on space, and it's all too easy to lose control and end up crashing your drone into a neighbour's garden. Even worse, you may not know exactly which garden it landed in, and won't be able to get it back (we know this from unfortunate first-hand experience). In fact, it's well worth putting some contact details such as an email address on a label stuck somewhere on the drone just in case.



Photography by Jim Martin

The best place is a field, park or other open space where there are no trees for the drone to get caught in, and no people or dogs to hit. Also bear in mind that you can only fly (safely) in relatively windless conditions, and don't forget that it might be a lot windier up in the air where the drone is flying than your controlling position on the ground.

Spares

The fragile nature of drones means you will probably break propellers (rotors) and other bits and pieces fairly regularly. All drones come with a full set of spare rotors, but as two rotate anti-clockwise and the other pair clockwise, you've only got two spares for each pair of spindles.

For this reason, it's worth choosing a drone for which spare parts are easy to obtain. A low purchase price might be

tempting, but it could be a waste of money if you can't buy extra rotors. Sometimes, you'll get discounted spares if you order at the same time as the quadcopter, and a couple of sets of rotors are a must.

Another point to note is that you won't get brushless motors on cheap quadcopters. They have cheaper brushed motors that have a much more limited lifespan. This is fine if you can buy spares (which are usually cheap), but you will need the skills to remove a burned-out motor and solder in a new one.

The DJI Phantom and Parrot AR.Drone have brushless motors, which should last a lot longer, and require no maintenance.

Privacy and the law

You can read all about the rules for flying 'recreational' drones in the UK at caa.co.uk/uas. Suffice to say that you are responsible

for any collisions and that it's illegal to fly your drone "over a congested area". You should also "think about what you do with any images you obtain as you may breach privacy laws". Basically, don't post any aerial video on YouTube or social networks.

We've reviewed six drones, all of which come with cameras. Only the DJI Phantom records what we'd call decent video: the rest are either mediocre or downright rubbish. Poor-quality video is fine if you want to use it simply for flying the quadcopter, but if you want to use it in home videos or for sharing with friends, be prepared to spend more than £200.

One other option is the 'hobbyist' V666 quadcopter from WLtoys. It's a large machine, similar in size to the AR.Drone and is relatively easy to upgrade. It can carry a lightweight GoPro-style camera, enabling good-quality 1080p footage on a budget.



DJI PHANTOM 2 VISION+ V3.0

£940 inc VAT • dji.com

PC ADVISOR
BEST BUY

Build	★★★★★
Features	★★★★★
Performance	★★★★★
Value	★★★★★
Overall	★★★★★

DJI is one of the best known consumer drone manufacturers, and the Phantom 2 Vision+ V3.0 is a great example of why it's worth spending a lot of money.

First, it's important to understand why this drone costs almost a thousand pounds. It's much smarter than cheaper models, and is able to hover in one place without you even touching the controls. Secondly, it has a proper gimbal and a 1080p camera which provides stunning, steady aerial footage. It's also well built and the big battery gives up to 25 minutes of flying time, and the range extender - the small box on top of the remote - means there's you can control the Phantom as far as 1km away. Finally, it has GPS, so you can set a location to which the drone will return if it loses connection to the remote control. You can even set a series of waypoints for automatic flying. And don't overlook the fact that spares are easy to come by.

It's hard to overstate how easy it is to fly the Phantom 2. Once the compass is calibrated, there's no need to adjust any fiddly trim controls: you just take off and the on-board processors ensure a stable flight. Only tiny movements on the sticks are needed to move the craft around in the air, allowing amazingly precise flying.

New in version 3.0 are upgraded motors and propellers, which let you carry more weight without reducing flight time. Also, the remote has a built-in lithium rechargeable battery, so you won't be burning through AA batteries as with many other quadcopters.

The remote has a clamp for your smartphone, and the app works with iOS and Android. Using it, you can

see live (albeit low quality) video from the camera along with lots of other useful information such as altitude, battery life, number of satellites picked up and more. You can also control the tilt angle of the camera, but the updated remote has a shoulder rocker dial for easier, and more precise, control.

Video quality is in a completely different league to many of its cheaper rivals. As well as being fitted with a 1080p camera (as opposed to the more common 720p) the footage is rock solid. If you're buying a drone primarily for video, you'll regret buying a non-stabilised drone.

The Phantom 2 is available to buy with no camera and gimbal (for around £500): you can then buy those separately. For example, if you have a GoPro Hero 3 or 4, you can buy a gimbal designed specifically for it for around £300. The total cost is then roughly £1,000, but (if you have the Hero 4 Black Edition) you can shoot amazing 4K video. You can also buy a complete FPV (first-person view) kit for the Phantom 2 including 3D goggles, which lets you fly it as if you were on board.

This costs around £300.

Some people say you shouldn't buy an expensive drone as your first, and instead to start with a cheap one to learn how to fly. That's nonsense. If you buy a cheap drone, you'll only be put off by how hard it is to fly and by the poor quality of its video and photos.

VERDICT: Although the price puts it out of reach for many, the Phantom 2 Vision+ is an awesome piece of kit, and well worth its high price.





HUBSAN FPV X4

£160 inc VAT • hubsan.com

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★☆☆

Also known as the H107D, the FPV X4 is Hubsan's latest mini quadcopter. It builds on previous versions and addresses quite a few of the criticisms. It now has rubber feet but, much more importantly, it offers a live video feed to the 4.3in colour screen built into the controller. That's why it's called the FPV: first-person view.

The quadcopter itself is miniscule, roughly the same size as the Revell X-Spy. It comes with a propeller guard, which is useful to use while learning to fly. You'll have to use the included tool to take off the rotors as the guard isn't fitted by default.

Video is higher resolution than the X-Spy, but at 640x480, it's nothing to get excited about. You can record the video, but you'll need to install a microSD card in the slot in the controller. That wouldn't be a problem if the quality of the video signal were better. Unfortunately, in our tests, the signal was choppy and all the interference gets recorded to the SD card. You'll see the least interference if you fly outdoors far from buildings in an open area.

Oddly, video is stored in AVI format in 640x240 format, so you'll have to find a suitable video converter if you want to watch it on your PC or upload it to Facebook or YouTube. Given the poor quality, you'll probably decide not to bother. In fact, it's such a faff that Hubsan includes an addendum to the manual to explain all this.

The manual, surprisingly, is written in good English and explains everything you need to know in order to learn to fly the quad along with sensible advice to avoid breaking or losing it. The controller has two modes. There's even an Expert mode that lets you configure the controller sensitivity, so you get full control of the drone for more accurate flying. It means you can grow into the FPV X4 as you get more skilled in flying it, and perform flips and loops.

We found the FPV X4 was a bit easier to control than the X-Spy, but like its rival, you'll find the learning process slow going as you get only seven minutes of flight time between charges. At least recharges

are faster at 30- to 45 minutes. It's really hard to make it hover, as it drifts around like most 'dumb' quadcopters, and it's too small and light to deal with flying outdoors in windy conditions.

The good news is that spares are widely available, with batteries costing as little as £3.30 if you buy in bulk. You'll want to invest in some rechargeable AA batteries suitable for high-drain devices, as the controller will finish off a set of alkalines in next to no time. You can't turn off the live video screen to save power, but it does have a timer, which starts the moment you power it on, so you can keep track of how long you've got until the battery is about to run out.

VERDICT: For the price, video quality is poor, so don't expect to be recording amazing footage from the air. If you invest in some extra batteries and time in learning to fly it properly, the Hubsan FPV X4 can be a rewarding and fun quadcopter.





LISHITOYS L6039

\$60 (£39) • cn.lishitoys.com/eng/main.aspx

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★☆☆

The L6039 is a surprisingly cheap drone considering it comes with a 2Mp camera. Just be sure to order the correct model, as there's a cheaper one which comes without the camera. Our review model came from Geekbuying.com, but other sites offer a similar model whose remote control lacks the LCD display which ours has.

It's bigger than you might imagine at 300x300x65mm, and this helps it to be a little more stable in the air. Video recording is at 640x480, and photos are shot at 1280x960 pixels. Unfortunately, during testing we found a loose cable between the quadcopter and camera prevented the 'record' signal being sent, but once each cable was pushed home it worked correctly.

There's no smartphone integration, nor any facility for seeing live video from the camera. To record video, you push the button on the remote, and press it again to stop. Pressing the camera button takes a photo, but doesn't work while you're recording video.

You get four rotor protectors in the box, which must be screwed into place, so aren't quick-release. There are also removable stands ('landing skids') and a set of replacement rotors. You can add an extra set of blades to your order for just £1, and extra batteries cost about £4.50. Given that each battery lasts around eight- to 10 minutes, it's well worth having a spare.

The controller has micro-adjustment for front, back, left and right, but our review model didn't need any adjustment at all: it flew reliably out of the box. Another button swaps the functions of the left and right sticks, but unlike the WLtoys V666 remote, it doesn't swap over the spring mechanism which means it springs to 50 percent throttle when you let go: not ideal.



We had a few successful flights in a local park using the low-speed mode. There's also a high-speed mode you can toggle via the remote, but before we had a chance to test that and get some more footage, the L6039 appeared to lose connection with the controller and flew off. And that was the last we saw of it. Most likely it was due to the transmitter batteries running flat, despite the LCD panel showing a 'full battery' icon.

VERDICT: Overall, aside from the flyaway incident, the L6039 is a good-value starter quadcopter, and also one of the cheapest with an on-board camera. Video quality is understandably mediocre, but you have to pay a lot more to get good HD footage.





PARROT AR.DRONE 2.0 ELITE EDITION

£230 inc VAT • parrot.com/uk

Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆

While the AR.Drone 2.0 is by no means the best drone you can buy, Parrot deserves some credit for helping kick-start the quadcopter industry. The second version of the drone was launched at CES in January 2012, so this is in effect a three-year old quadcopter. Indeed, the company has just launched a new model: the BeBop Drone.

For £230, you get a lot for your money. First, its build quality is in a different league to cheaper quadcopters. The frame is made from nylon and carbon fibre parts, and you get brushless motors that are much more durable and reliable than cheaper brushed motors.

Next, you get a lot of processing power, which means you can take advantage of automatic take-off, hovering and landing. With cheaper quadcopters, you'll have to practice for some time before you're able to hover, fly and land safely. There's also a pretty good 720p camera with a lens that has a nice 93-degree field of view. It's not stabilised, but footage is a step up from quads costing £50 to £150. You can plug in a USB flash drive and record footage directly, and there's the option to buy Parrot's 'Flight Recorder', which includes 4GB of storage and a GPS receiver, although at £99 it's rather expensive. This allows automatic piloting by defining a series of waypoints, something you can't do without GPS.

In the box you get two hulls, one for indoor use and another - without the rotor guards - for outdoors. Unlike some quadcopters, the AR.Drone 2.0 is technically not ready to fly, though. You'll need to bring your own iPhone or Android smartphone and install the AR.FreeFlight app. There's still no official Windows Phone app but - weirdly - FreeFlight is also available for Windows 8 tablets.

Even though it goes against our 'we shouldn't need to read the manual' philosophy, your first flights will be far less frustrating if you do, as the controls are far from obvious. It takes a lot of getting used to controlling the drone by tilting your phone (physical sticks are always better), but you can optionally use virtual on-screen joysticks.

But unless you're using the live video stream to pilot the AR.Drone, it's hard to use these since your fingers tend to drift off the controls.

What's nice is that the app offers lots of advanced controls, such as limiting the drone's altitude. If you've got more than 30 percent power remaining, you can press a button to make the AR.Drone do flips. We found the (new, larger) battery was good for about 12- to 15 minutes' flying. Recharging takes between 60- and 100 minutes, depending on how discharged it is. Spare batteries cost almost £40, but there's a vibrant third-party marketplace where you can buy a higher-capacity battery (good for 20-minute flights) for £30 or less.

You're also limited by the range of Wi-Fi which is noticeably poorer than most cheap drones. At least the AR.Drone 2.0 will stabilise and hover when it loses the signal, rather than flying away uncontrolled. Plus, if you fail to heed the low-battery warning, it will land itself when it's almost run flat. So don't fly over water.

VERDICT: If you can't afford a DJI Phantom, then the AR.Drone 2.0 is the next-best thing. Its ability to hover and the general high build quality make it worth spending this amount of money.





REVELL X-SPY

£99 inc VAT • revell.de/en

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆

Quadcopters are a new line for Revell, which is best-known for its plastic model kits. The X-Spy, however, requires no assembly whatsoever, unless you count installing four AA batteries in the remote and installing the Revell Control app on your iPhone or Android smartphone.

The drone is tiny, measuring just 148x148x45mm, and has its camera mounted underneath. In the box is a spare set of rotors, and you'll probably need these fairly quickly: the propeller guards are flimsy and don't offer much protection when the quadcopter hits solid objects.

We tried the Android app on a Moto G: the clamp on the remote wasn't big enough to accommodate an iPhone 6 Plus in Apple's leather case. The app allows you to see live video from the drone once you connect to the X-Spy's Wi-Fi network.

The order in which you power everything determines how you control the copter. The craft itself must always be powered on first. If you then turn on the controller, you can use the physical sticks. However, if you leave it turned off and connect the app to the X-Spy's Wi-Fi, you can then control it using on-screen joysticks - or by tilting the smartphone. Ultimately, we preferred the physical controls, using the phone purely for video. The app also lets you begin and end video recording, as well as take photos. Video is recorded directly to the smartphone: there's no microSD slot on the drone, nor on the remote.

Somewhat disappointingly, given the 'HD' claims, video resolution is a paltry 320x280, so you're not going to proudly post stunning aerial vistas on YouTube.

Instead, the X-Spy is intended as an inexpensive introduction to FPV flying - and a bit of fun.

If this is your first quadcopter, it will take a while to master the controls. Like its rivals, you have to adjust the sticks constantly to hover, and even then it's practically impossible. We found much more input was needed to make corrections than with the Hubsan H107D. Both drones are capable of loops, though, and there's a choice of high or low speed which you can toggle using a button on the remote.

If you do want to perform flips, Revell advises removing the camera, although the manual doesn't explain how. To remove the camera, hold the X-Spy so that the camera is pointed away from you and then carefully push its body from the back, allowing it to slide off the mounting rails. You then need to carefully disconnect the camera's plug from the X-Spy's input port.

Once you've mastered hovering and the basic flight controls, you should be able to fly the X-Spy indoors without too many incidents. Outdoors, you'll need windless conditions to have any kind of control.

Flight time is another niggle: it's the shortest of its peers at just five minutes. And, because the X-Spy is brand new, spare batteries aren't easy to come by and it's a 100-minute wait for a recharge. You can order spares from all good toy and model shops, but they're not the cheapest. Rotor blades, for example, cost £3.50, while a battery pack is priced £13.

VERDICT: As long as you have an Android phone or an iPhone, the X-Spy is a good-value drone with FPV. However, if you can live without live video (or without a camera at all) there are cheaper options.





WLTOYS V666

\$149 (£100) • www.wlmodel.com/English

Build	★★★★☆
Features	★★★★☆
Performance	★★★★☆
Value	★★★★☆
Overall	★★★★☆

You could dismiss the V666 as just another Chinese clone. But look beyond the fact that it's a cheap copy of the Parrot AR.Drone and there's a lot to like. Out of the box, it's a ready-to-fly first-person-view quadcopter. Unlike the cheaper, smaller Revell X-Spy, it doesn't need a smartphone for live video as it comes with a 4.3in LCD display.

It's a better setup than the Hubsan FPV X4 because the monitor is powered separately by its own rechargeable Lithium battery, and comes with a hood to make it easier to see in bright conditions. It's a proper 5.8GHz system with removable SMA antennas, so you can upgrade them (or buy a lighter version for the quadcopter).

The remote control is cheaply built, but it has a clever mechanism for swapping the functions of the left- and right sticks. It means that you can use the right-hand stick as a proper ratchet throttle control.

Underneath the quadcopter is a 720p camera, and it even has an anti-vibration mounting system that helps stabilise footage a bit. You get a 4GB microSD card, which slots into the camera and records footage directly, unlike the Hubsan, which records from the remote control. Buttons on the remote let you start and stop recording while in flight, and you can take photos at 2Mp resolution.

Because of the low price, you can't expect high-quality motors and WLtoys hasn't even installed ball bearings for the rotors. For this reason, it's worth ordering at least two spare motors along with the V666, and a set of eight ball bearings to replace the brass bushes. Most spares are available from GearBest.com, which supplied the V666 for this review, with spare batteries costing just £7 if ordered at the same time as the quadcopter. Spare motors are just £3 each.

Measuring 350x350mm and weighing 350g with the foam protector attached, the V666 is heavy, but you

can save 70g by removing it. This will increase the life of the motors and also flight time. We found the 1200mAh battery lasted about eight minutes, and took just under an hour to recharge.

Footage from the 720p camera is okay considering the price, but it's hardly what you'd call high definition. It's more like low-resolution CCTV footage, and colours are washed out. If you're comfortable with cracking the camera case open, you can install a wide-angle lens (around £7.50), which will provide much better aerial footage than the standard one. Still, it's not a patch on the DJI Phantom 2 Vision+ footage, although that drone costs almost 10 times more.

In an open space far from the interference of Wi-Fi routers and mobile phones, the live video is good, but the framerate drops noticeably when you're recording at the same time.

In flight, the V666 is pretty stable - much more so than smaller quadcopters such as the X4 FPV and Revell X-Spy. It's possible to perform flips, but this kind of aggressive flying is likely to shorten the life of the motors and contribute to them burning out. Range was also good: we were able to fly at over 100 feet with no signal or connection problems.

There's no GPS or automatic hovering, but you can't expect those features for this price. What's good is that, despite the manual's horrendous English translation, the V666 supports 'headless mode'. This is a rare feature and means you can fly the drone from your perspective: even if it's flying towards you, a right-hand push on the stick will make it move to your right and not left.

VERDICT: The V666 is a good starter FPV quadcopter, and is great value considering it includes everything you need to fly for just £100. Spares are also readily available (from China) and aren't expensive.



VPN services

If you're concerned about online privacy, then a Virtual Private Network will help keep snoopers at bay. **Andrew Harrison** looks at six services designed to prevent others from spying on your web surfing

Before you even start looking for the best VPN to suit your needs, you should consider if it is a Virtual Private Network service that you actually require. The term VPN is today frequently bandied around as a means to geolocate oneself elsewhere, usually to counter businesses that restrict their online services to users from within a particular region.

Many people use such countermeasures in order to enjoy the BBC's iPlayer streaming services while outside the UK; or to make use of the expanded catalogue of film and television offered by US Netflix, in contrast to the more limited selection in the UK.

However, for simple virtual geographical relocation to gain an IP address in the required region, a proxy server is all that is required. Proxy servers can be found more readily and cheaply from various free and commercial providers, sometimes using as little as a basic web browser plug-in.

But it's the 'P' in VPN that is of most benefit to those that really need it. VPN was originally devised for enterprise businesses to allow communications beyond the company firewall that could not be easily eavesdropped while traversing the public internet. As well as connecting various outposts of the company based in different cities or countries, it allowed staff to work remotely away from the office, whether from home or while on the road. Yet they could still connect securely to the company intranet transparently as if they were within the same physical building.

Now VPN is becoming increasingly useful for anyone that wishes to surf the internet with an element of anonymity, by helping to disguise their originating home IP address. VPN connections are also put to use for political safety; for example, in order to avoid state censorship and persecution, busting through filtering and logging at the ISP or state firewall level.

Another application may be to help sidestep the relentless tracking by commercial corporations such as social media and online advertising brokers. They now consider every net user fair game for tracking and profiling, collecting

personal data and targeting advertising at us for profit. Or a VPN link may be used to minimise surveillance by the US and UK intelligence agencies that we now know record all of our online activities and personal communications.

There is the darker side of VPN use too, associated with criminals and others who try to stay off the radar of law enforcement.

In between the two opposite ends of political and criminal applications of VPN is the greyer area of peer-to-peer file sharing, for which some users prefer to avoid any possible retribution from big-media trade associations such as the MPAA by using encrypted VPN connections.

Free services

Everyone likes good value, and nothing looks quite as invitingly good as free. But as with any online service that is billed as free, beware that you're as likely to be selling your soul as getting a good deal. Offers that promise free VPN connections may have dangerous strings attached.

An example is HotSpot Shield, a popular free VPN service that installs unwanted toolbars, third-party applications, corrupts your default search provider settings and then bombards the hapless user with in-line, pop-up and pop-under ads. Depending on your viewpoint, such weaponised 'free' software will be classed as unwanted applications at best, or malware at worst.

It pays to read carefully the terms of service. AnchorFree, the developer of HotSpot Shield is good enough to warn you in its terms of service: "AnchorFree may deliver third-party Advertisements within the content of any web page accessed... You hereby acknowledge and consent that AnchorFree may alter the content of any web page accessed for the purpose of displaying advertisements."

Trust and state surveillance

The use of any VPN service entails some degree of trust, since the provider is in a privileged position to see all your online activity, and you only have their word that they won't sell you out to third-party

marketers, other malefactors, or worse.

If your use of a VPN service is to thwart mass surveillance by the UK and US governments' intelligence collectors at GCHQ and NSA, you need to be sure that the level and application of encryption your VPN service employs has not been compromised by said agencies.

While publicly known protocols such as AES, TLS, SSH and the IPsec suite are officially believed to be secure, the exposure of the Bullrun and Edgehill programs illustrate that back doors and crackable protocols have been deliberately introduced in some security protocols. RC4, part of SSL, is likely wide open to FVEYS eyes.

The current problem is that we don't know exactly which protocols are compromised, and how badly.

The *New York Times* discussed the crucial revelations made in Edward Snowden's documents. "By 2010, the Edgehill program, the British counterencryption effort, was unscrambling VPN traffic for 30 targets and had set a goal of an additional 300. A 2010 document calls for 'a new approach for opportunistic decryption, rather than targeted'. By that year, a Bullrun briefing document claims that the agency had developed 'groundbreaking capabilities' against encrypted web chats and phone calls. Its successes against Secure Sockets Layer and virtual private networks were gaining momentum."

Even if the core crypto is still secure, you must also rely on the developer of proprietary VPN software for your Windows, Mac or Linux PC, or your mobile device. If your VPN provider is based in the US or UK, they may have been ordered to introduce a backdoor, and be subject to a secret court order that forbids them from warning their customers.

There is also the issue of logging. Many overseas VPN providers make a strong statement about not logging their users' connections, which could be turned over to state intelligence or law enforcement agencies on request. In the UK, for instance, logging was once at the discretion of the provider but since last summer's DRIP Act



2014, communications providers must hold logs that can be requested on demand by government offices.

Many European countries have had similar mandates to log customer data, making privacy supporting nations such as Romania and Sweden a popular home for new VPN startups, while ironically the US does not at present.

Name	Servers	Load	Users
Canada	9	20%, 1817/9000 Mbit/s	738
France	1	88%, 88/100 Mbit/s	27
Germany	6	8%, 464/6000 Mbit/s	248
Hong Kong	1	11%, 106/1000 Mbit/s	33
Latvia	3	42%, 126/300 Mbit/s	46
Netherlands	26	19%, 4602/24200 Mbit/s	1602
Portugal	1	14%, 14/100 Mbit/s	10
Romania	1	14%, 138/1000 Mbit/s	53
Singapore	1	24%, 238/1000 Mbit/s	90
Spain	1	6%, 58/1000 Mbit/s	29
Sweden	2	12%, 238/2000 Mbit/s	162
Switzerland	1	17%, 168/1000 Mbit/s	99
Ukraine	1	12%, 121/1000 Mbit/s	32
United Kingdom	4	14%, 577/4000 Mbit/s	345
United States	11	14%, 1546/11000 Mbit/s	790

PC ADVISOR
BEST BUY

Ease of use ★★★★★
Features ★★★★★
Privacy ★★★★★
Value ★★★★★
Overall ★★★★★

AIRVPN

€7 (£5.20) per month • airvpn.org

AirVPN is an enthusiast-led operation, formed from a collective of privacy-rights activists, hackers and two lawyers in 2010. One of its stated missions is to deliver technical tools aimed to enhance and exercise the fundamental Right to Privacy, as reserved in the Universal Declaration of Human Rights, article 12; and the European Convention of Human Rights, article 8. It started as a free service and now has a commercial side to maintain the project.

AirVPN currently has around 68 servers in Canada, Switzerland, Germany, Spain, France, Hong Kong, Latvia, Netherlands, Portugal, Romania, Sweden, Singapore, Ukraine, the UK and the US.

Prices start with a three-day trial costing €1, then €7 for one month, three months at €15, six months for €30 or €54 for 12 months. The minimum bandwidth you can expect is 4Mb/s in each direction, with higher speeds possible depending on server load. In our tests with a local UK server (Maidenhead) we saw 9Mb/s download, 6Mb/s upload and 5ms latency.

Software

AirVPN has an extensive range of support across many devices. The company's own AirVPN Client software is available for the three popular desktop platforms of Windows, OS X and Linux (Debian and openSUSE); as well as Android and even iOS using the OpenVPN Connect app from OpenVPN Technologies Inc. It is released under a GPLv3 licence so source code can also be independently verified by an experienced developer or security researcher.

Or you can configure a router or firewall to send all traffic through a VPN tunnel, with support for routers running DD-WRT and Tomato open-source router firmware and the FreeBSD-based pfSense firewall.

The Windows software comprises a simple no-frill interface with six tabs running across the top. These are marked Overview, Servers, Countries, Speed, Stats and Logs.

The Overview just shows to which server you're connected, download and upload numerical speed, exit IP address and connection time. It doesn't inform you of your current connection protocol, which could have been useful.

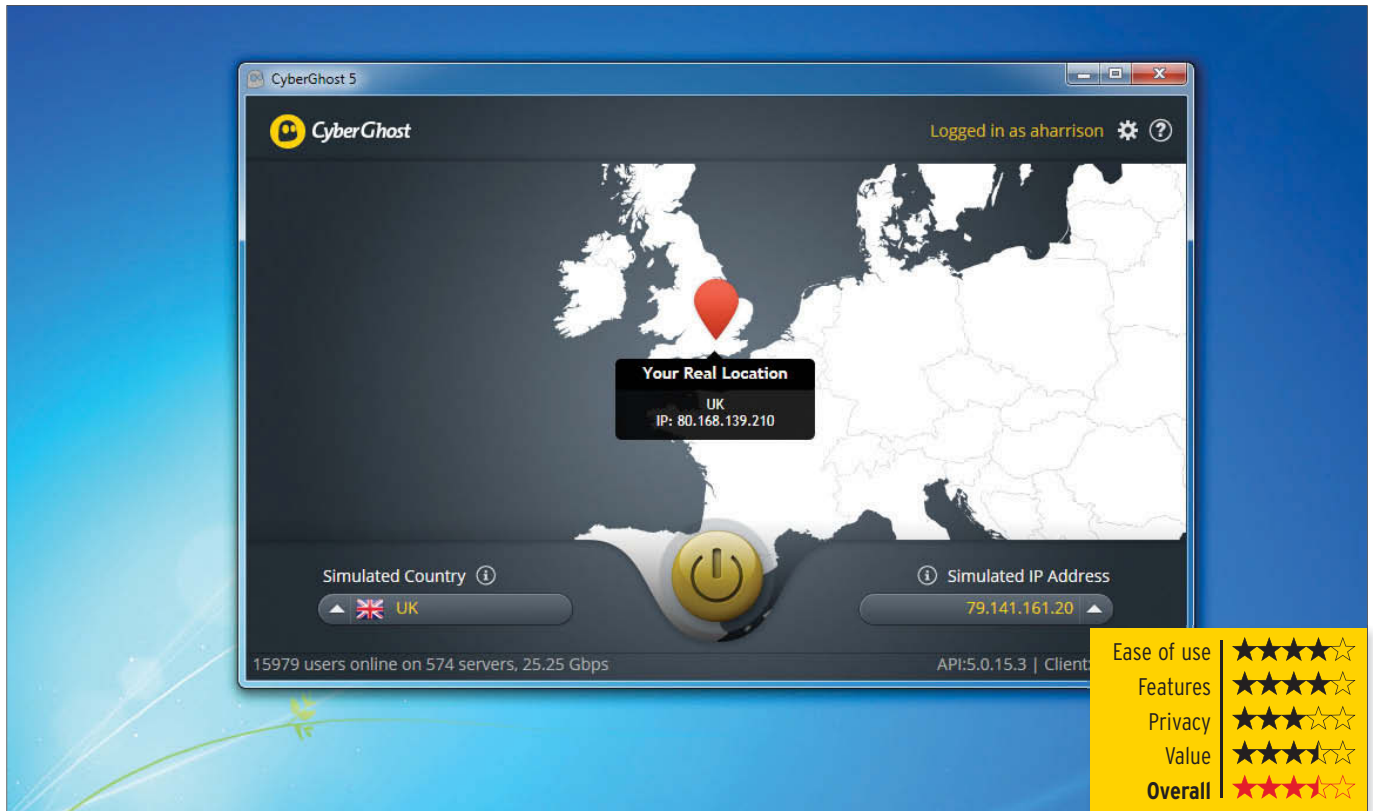
Servers gives a useful flat list of available servers, their location, latency, current load and number of connected users. These columns can be readily reordered to show servers in order of latency, for example. The Countries tab shows at a glance which national territories are available, again with an indication of server load and user numbers. While many servers have several servers equating to up to 1000Mb/s bandwidth, we noticed that France had only one, a 100Mb/s connection that was red-lined into saturation. But most areas showed more like only 10- to 20 percent load.

The Speed tab gives a very basic graph plot of throughput with thin plot lines. Its resolution in time can be switched so you can see traffic over the past 10 seconds, up to one day. In the Stats tab is the fine detail such as current protocol, available bandwidth, ping times and port numbers. It's an invaluable resource. And finally Logs is a line-by-line record of connections and routes.

The program's Settings allow fine-tuning the setup - for example, to always connect when its launched, which protocol to use between UDP and TCP and which port number, or if to attempt an SSH tunnel over more versatile ports such as 22, 80 and 443. Proxies and Routes can be tweaked, while the advanced user can delve into Advanced and Expert Mode settings.

AirVPN's cryptography is probably the best available. There is 4096-bit RSA for the first exchange, which enables Perfect Forward Secrecy (PFS) through Diffie-Hellman key exchange. After the initial key negotiation, rekeying is performed every 60 minutes, and this can be lowered by the user. The main data channel uses AES-256-CBC.

VERDICT: AirVPN is a powerful VPN service using the OpenVPN protocol, with a strong privacy policy and community following. It's not the fastest available but we're told that it ignores DMCA and European equivalent notices, respects the ECHR and keeps no logs that can be exploited to reveal customers' data during connections.



CYBERGHOST VPN

\$7 (£4.70) per month • cyberghostvpn.com/en_gb

CyberGhost was founded in Germany by entrepreneur Robert Knapp, before quickly moving the operation out of the country in 2010. It outran Germany's new data retention laws and settled in Romania where there is currently no mandate to log user activity.

The company professes a strong policy of customer privacy, turning down VC funding in favour of crowdsourced capital raising, and it even publishes a transparency report on its website. This is more for information purposes, showing on a country-by-country basis where requests for information about its customers personal data are originating. But since it does not keep logs, we're told there is nothing to turn over from any of these requests.

CyberGhost has an interesting way to cut the link between a customer's VPN credentials and their true identity as established by payment details. It out-sources account payment to a separate company that only processes card details without seeing login names.

Software

The CyberGhost proprietary client software is available for Windows, OS X, iOS and Android. Or you can opt for a manual setup using any of these systems' built-in VPN client interface. Linux users can use the service with their choice of VPN binaries that support the service's protocols of OpenVPN, PPTP and L2TP/IPsec.

Launching the program the first time, you see a small window with a map showing your current location as established by your real IP address. If you have bought a subscription, you just enter your login name and password. Then to start a connection, click on a large yellow button in the application's window. Or in the words of the company: "Launch the application and press our magic yellow button. We swear, your whole life will change once you click on it."

Anti-fingerprinting technology optionally changes the browser language with server location, and removes info about your

operating system and browser version. A content blocker removes social plug-ins like the Facebook Like button, which is used by the social network to analyse your surfing behaviour, and blocks other requests from hidden trackers on websites.

For Windows users, the application modifies Registry settings (HKCU\Software) to start automatically upon reboot in Windows, although this can be switched off from Settings.

One thing you can't seem to do is to select your choice of VPN protocol through the CyberGhost client software. For the Windows version of the software, TAP drivers from OpenVPN Technologies Inc are installed with the program, so we can assume that OpenVPN is a possibility; OS X does not seem to have the necessary TUN/TAP kernel extensions included in the install process, suggesting an L2TP/IPsec or PPTP connection.

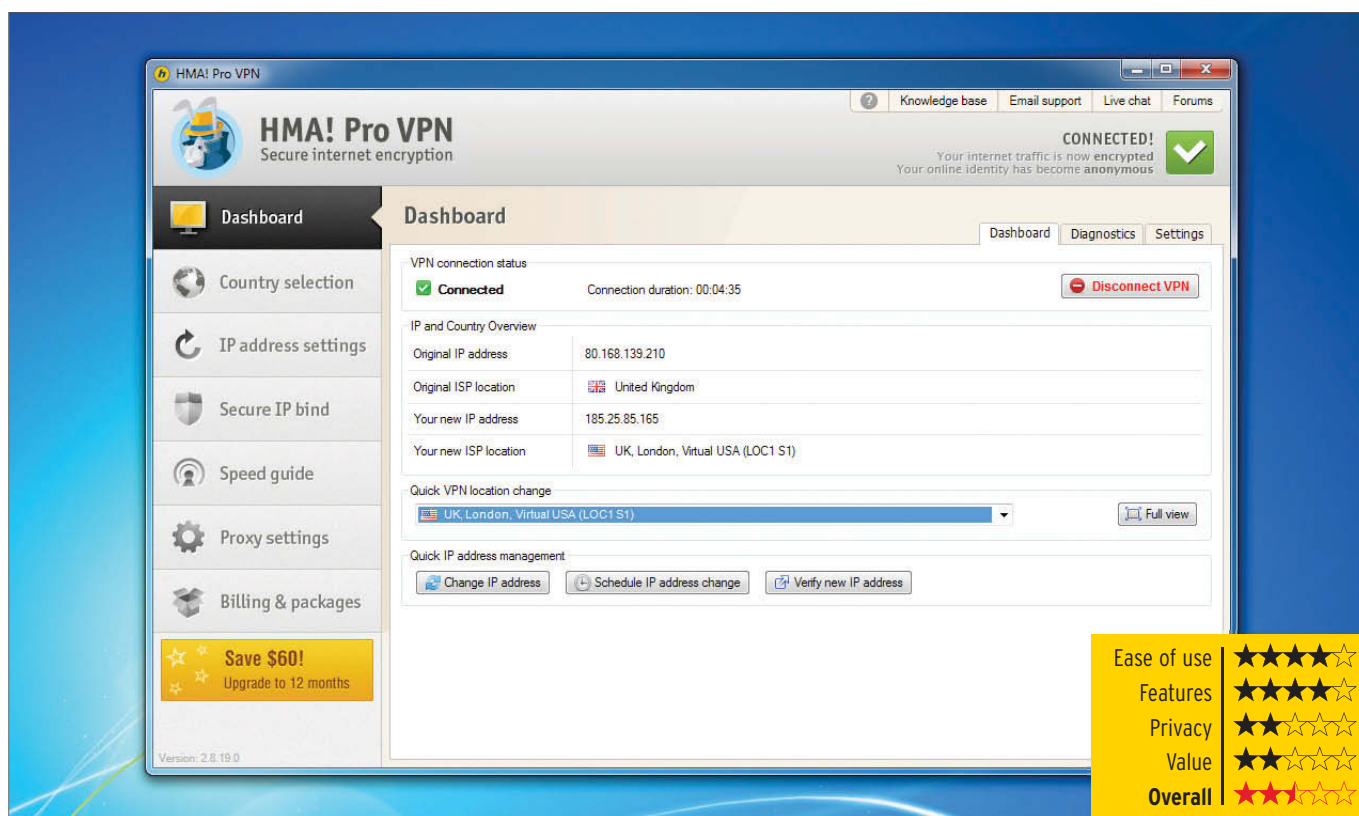
Delve into the Advanced Settings in the Windows version and you can exchange the default UDP connection mode to TCP, although this is not offered in the Mac version.

In our testing, the VPN connection did not appear to leak DNS requests. Our chief concern with the use of CyberGhost's VPN software was an altogether different data leak though.

Both Windows and OS X versions of CyberGhost software were making outgoing connections to Google servers at every launch. These were to various Google-owned servers, with connection attempts made before an encrypted tunnel is started, so your real IP is revealed to Google at the very least.

After discussing the issue with CyberGhost we were informed that the company was making use of Google Fonts API, but that this potential privacy issue was now being resolved by moving the fonts to its own servers.

VERDICT: CyberGhost relocated itself to one of the few European countries that took personal privacy seriously, providing a good base for commercial VPN services. Its software is easy to use and many other connection options are available for other devices, too. If your motivation for using a VPN service is personal privacy, you may be heartened to hear the Google API issue is also now being resolved.



HIDE MY ASS! PRO VPN

£11.52 per month • hidemyass.com

Hide My Ass! is a UK-registered and based VPN company. It has an extensive portfolio of VPN servers, at home in Britain and spread all around the world from Australia to Uganda. It offers its own client software for Windows and OS X, and has mobile apps for iOS and Android. These allow phones and tablets to be configured by a more friendly looking interface than these platforms' built-in VPN software.

It's already recognised that your VPN provider knows who you are and may keep logs of your internet use. In the case of HMA!, it has long been keeping records of its users' real IP and connection logs.

That's how we're told hacker-activist Cody Kretsinger was identified and arrested in September 2011 after using HMA!'s services. Based in Arizona, USA, Kretsinger was a member of LulzSec, the hacker collective known for compromising the security of various websites, including the CIA, Sony Pictures and News International.

Kretsinger used the Hide My Ass! VPN service to assist his anonymity while working under the name 'recursion'. His real IP address and identity was passed over to the FBI by HMA! on request. The British company stated that it was presented with a court order.

Hide My Ass! announced that it was complying with local UK law when it passed its customer's personal data to a foreign power. This made a clear statement that it did not itself wish to be prosecuted for its customers' activities in any foreign country that was able to secure a UK court order.

Prices start at £11.52 for one month, then £50 for six months or 12 months at £79, making it the most expensive VPN service we've tested. Even with a paid-up account, we found advertisements appearing in the main application window.

Software

HMA! publishes a list of around 700 servers in various locations in the world. In our experience, not all were accessible at any given

time. It was not clear if this was due to the server being offline or just working at its capacity and unable to accept any new connections.

Traffic speeds were very good, depending on the server and time, with up- and download speeds often exceeding 20Mb/s, when tested on an 80/80 leased line.

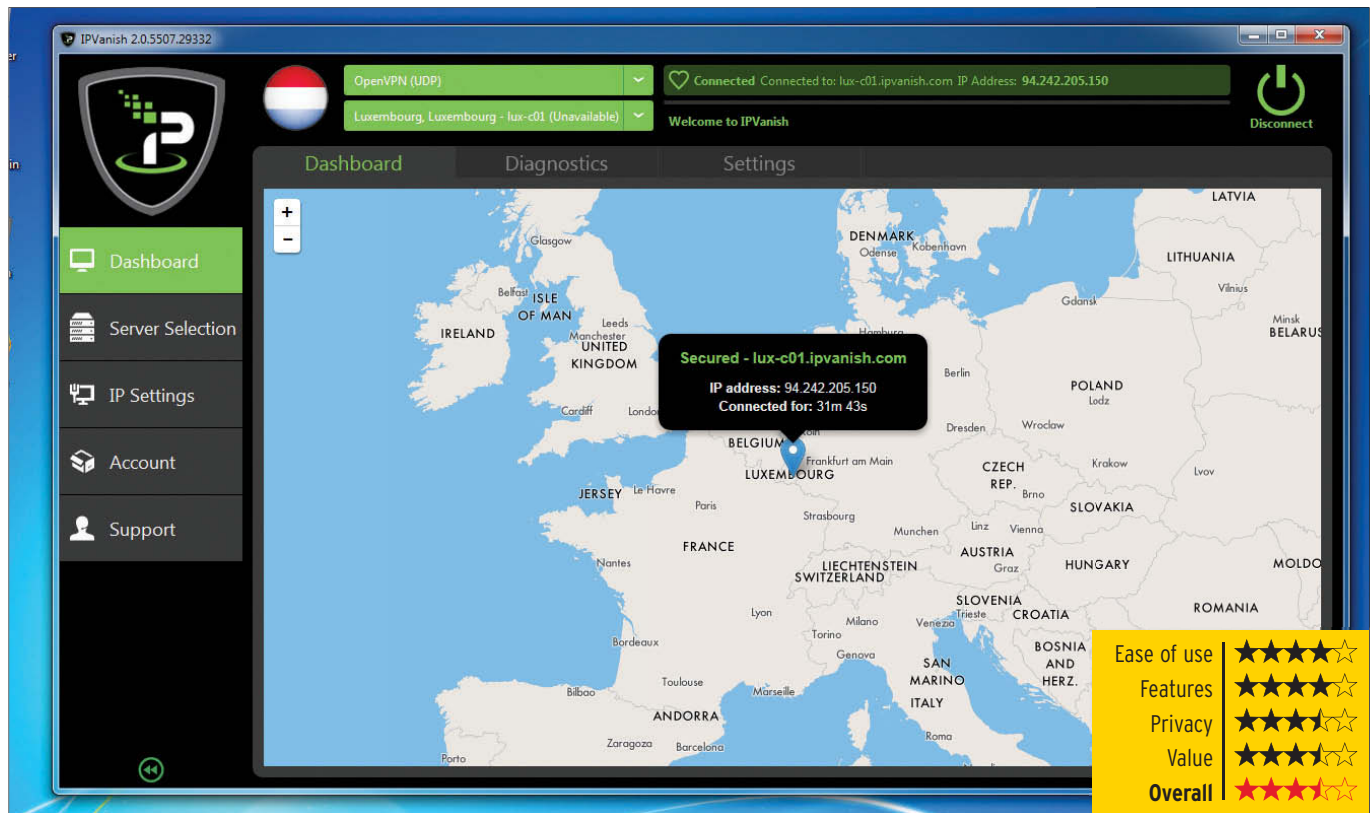
The HMA! for Windows software uses Microsoft's .NET framework to build the program; the OS X client meanwhile uses the open-source Mono framework, originally a Linux port of .NET. It replaces earlier Mac client software that required separate TUN/TAP kernel extensions to be installed.

The HMA! interface is easy to navigate, and enables quick virtual georelocation from one of its side tabs. The Windows and OS X applications rely on Google, with the user's computer making serial connections to Google servers as soon as it is launched. The company told us it believes it has sandboxed these connections to the data-harvesting specialist to ensure personal data is not leaked.

HMA! Pro VPN software uses OpenVPN as its default communication and encryption protocol, or you can switch this to Microsoft's insecure PPTP from a protocol drop-down menu. The Mac application includes integration with OS X's notifications system to show when and to where you're connected, with flags popping out of the screen's top-right corner.

Common to both Windows and Mac client software, the HMA! program includes a speed guide, to help identify which of its servers are currently over-subscribed or otherwise providing poor service, and which are operating more quickly. And with the help of a menu bar/taskbar shortcut, you can easily switch your gateway IP address without opening the main application windows.

VERDICT: HMA! Pro VPN is a versatile VPN services with a large number of servers listed all over the world. It has attentive technical support staff to help with setup issues. The company is based in the UK and abides by our data-retention laws, and has demonstrated it's ready to inform on its users when asked. For local network security and placing yourself virtually anywhere for shopping or entertainment purposes, it works as advertised, but the cost is high.



IPVANISH

\$10 (£6.70) per month • ipvanish.com

IPVanish is a tier-1 VPN service, the only one in the world according to the company. This may enable the best network speeds, as a tier 1-connected communications provider can reach every other network that forms the internet without having to transit.

The company was founded in 2012 by a group of network engineers who work at a major content-delivery network (CDN) and network services business, which they declined to name. It is based in Orlando, Florida, USA.

Its privacy policy states that: "We do not track user activities outside of our Site, nor do we track the web activities of users when they are logged into our VPN Services." More specifically when we questioned this, an unnamed spokesperson told us that the company tracks nothing and keeps no logs. The only things it keeps are payment info, stored in a tested payment card industry (PCI) environment.

Prices start at \$10 (£6.70) per month billed per month, then \$27 (£18.20) for three months, or \$78 (£52) for 12 months.

IPVanish supports Windows and OS X with its own native applications, and also offers mobile apps for iOS and Android. For other platforms, including Windows Phone, Ubuntu Linux, Chrome OS and DD-WRT routers, it has comprehensive setup guides on its website.

Protocols of OpenVPN, L2TP/IPsec and PPTP are supported and you can connect two devices at the same time.

Many servers are made available across worldwide territories, and at time of press there are 52 in the US and Canada, six in central and south America, four in Oceania, four in Africa, 23 in Asia, and 80 across Europe (including 10 in the UK).

The company's tier-1 status is used to promote good network speed. Indeed, in our tests performance, it could not be faulted. We tried a local connection from London to a London VPN server,

and saw low latency of just 4ms, and up/download speeds of 35MB/s over our office leased line connection. And that was using L2TP rather than the generally speedy OpenVPN in UDP mode. We pinged servers in eastern Europe and transfers still held at around 30MB/s, with 40ms latency.

Software

The main interface window features a map showing your nearby area in the world, in our case Europe, with a balloon showing your current location based on geo-fixing your real IP address.

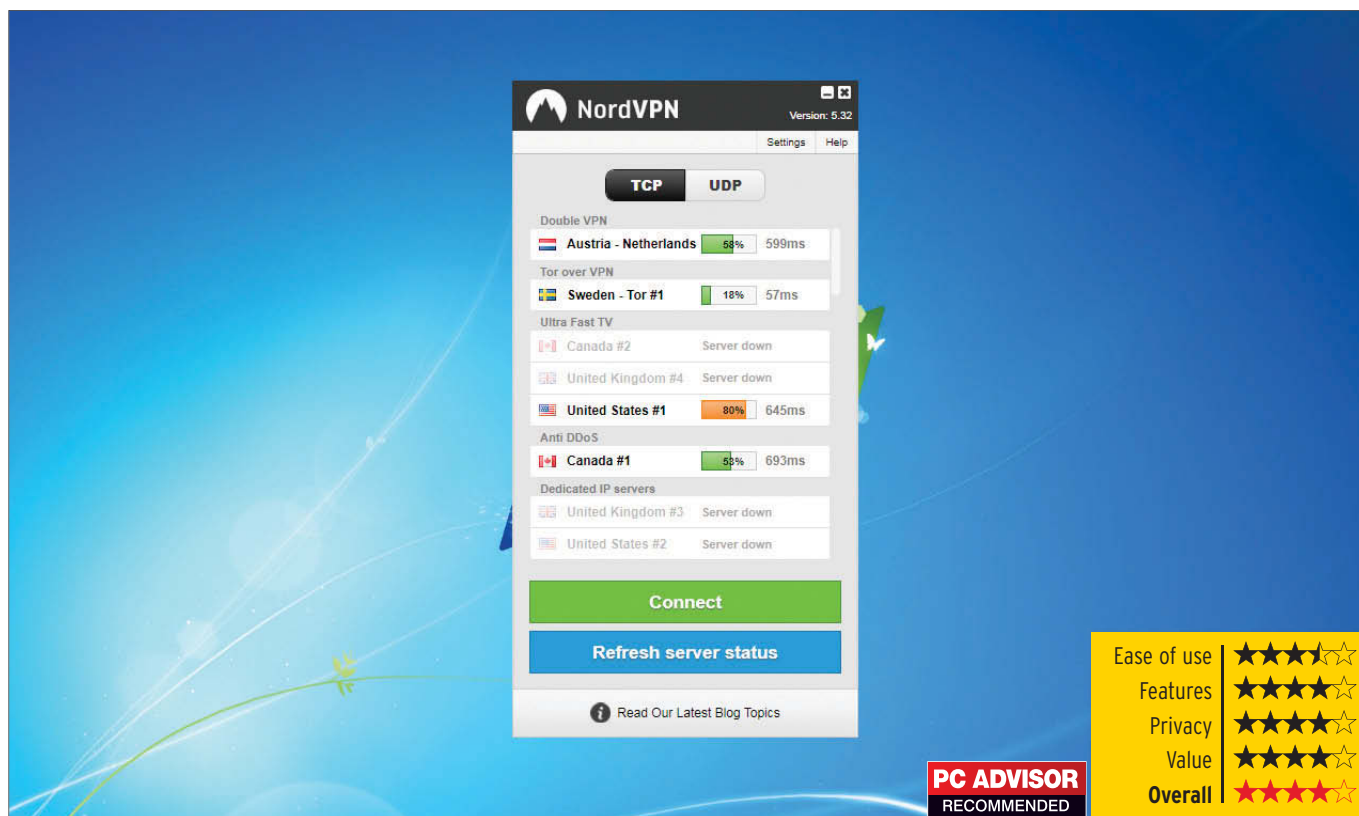
On the left are five main options: Dashboard, the primary interface; Server Selection; IP Settings; Account; and Support.

From the Server Selection window, you can select your preferred server by your usage type (for example, the fastest, or a media/gaming-optimised connection based on location in either the US, Canada or UK).

Alternatively, you can select from a flat list, which can be reordered by latency, last connected or country. There's also a selection of server by a simple graphical world map. Confusingly though, after we changed VPN server the previous location and country flag was still sometimes showing at the top of the main window.

The IP Settings option allows you to verify your current virtual IP address, as well as set the application to automatically change your IP address every 60 minutes, or an interval of your choice. The Account option besides letting you administer your account details includes a handy list of all available servers with a percentage load reading.

VERDICT: IPVanish offers a speedy connection at no more cost than the other services we look at in this group test, with an easy-to-use and administer interface in its own software. Based in the US, the company tells us that it keeps no logs. If your needs are to secure your surfing from criminals while using a Wi-Fi hotspot in a coffee shop, IPVanish is a versatile and above all speedy service available for many different platforms.



NORDVPN

\$8 (£5.40) per month • nordvpn.com

NordVPN bills itself as the world's most advanced VPN, a claim founded on its offer of additional and optional techniques that should help obfuscate your true IP even better than a standard VPN connection. The company is based and registered in the Republic of Panama, which is useful as the country doesn't include legislation to spy on internet users through enforcing communications providers to maintain logs of their customers' internet use.

The company name, we were told, was inspired by Nordic ideals like freedom and trust, an approach that NordVPN values and wanted to bring to its service, making its own input in liberating the internet.

Prices start at \$8 (£5.40) for one month, with six months costing \$25 (£16.70), or \$36 (£24.10) for 12 months. Native software is provided for Windows and iOS, and applications for OS X and Android are said to be coming soon.

One unusual feature that NordVPN offers is two-stage data encryption through its DoubleVPN service. This uses the AES-256 CBC cipher twice over using different keys, with the first connection made from user to its Austrian server, which is then relayed to the Netherlands server to give the user a Dutch indicated IP address.

Another option is TOR over VPN, where the user is first connected to the NordVPN server in Sweden, before being passed through the TOR network with an exit node that could be anywhere in the world.

Unfortunately, both these advanced features only work with the OpenVPN protocol, so you won't get native support on Windows, OS X or iOS for example without additional OpenVPN client software.

Software

The NordVPN application for Windows is a square-cornered Windows 8 interface set in portrait mode, and has the essential controls to route your VPN connection how you like. It also includes those handy features we've not seen elsewhere yet.

Only OpenVPN is supported with the Windows program, but you can choose between the integrity of TCP and the relative speed of UDP connections from this protocol. Using a manual setup you can use L2TP/IPsec or even the troubled PPTP protocol on any platform.

We counted a choice of 45 servers typically available at any time - for example, four US servers, four UK, two Swiss, three Sweden, one each in Spain and South Africa, and four in the Netherlands. The interface shows indicated latency time and server capacity, indicated by a horizontal green bar and a percentage figure. For servers currently under higher load, the green turns to orange.

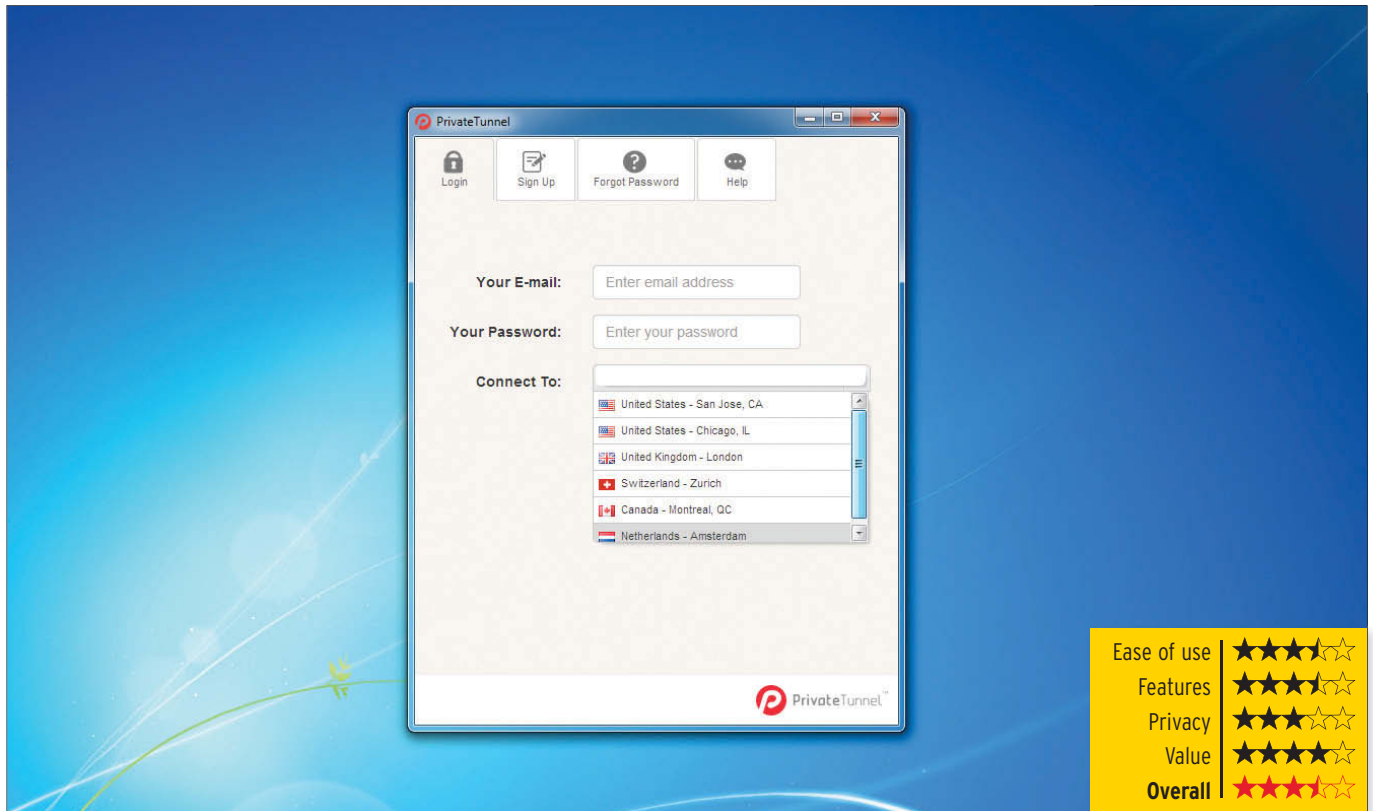
Besides a standard VPN connection, you can choose from a smaller selection of servers labelled Ultra Fast TV. These use the fastest net connections that NordVPN has purchased, intended for video streaming. We found three in Canada, the UK and US; and testing the UK option, we saw impressively low 6ms latency and decent 25MB/s down and 8MB/s upload speeds.

Another option is the Anti DDoS server, based in Canada, which is suggested for encountering less network interruptions. This server is equipped with four times more safety tools against distributed denial of service attacks, to make it more stable and secure.

From the program's Settings you can opt to start the VPN session at PC boot, select your choice of default TCP or UDP protocol, and add a proxy server. A handy process kill list lets you select applications that will be closed if the VPN connection is suddenly dropped, to ensure you do not leak through the public internet.

In our tests using the Windows client on one of NordVPN's regular London servers we saw 25Mb/s down and 13Mb/s up. Switching to the DoubleVPN mode gave us 5Mb/s and 1.75Mb/s with 56ms latency, using the two servers sited in Austria and the Netherlands.

VERDICT: NordVPN servers are operated under the jurisdiction of Panama, a country that does not require internet providers to monitor user traffic, and the company tells us it does not keep any logs at all. Combined with the competitive pricing and unique privacy and security options, NordVPN has one of the most attractive offerings for internet users looking for some needed privacy.



PRIVATE TUNNEL

\$12 (£8) for 50GB • privatetunnel.com

Private Tunnel is a commercial spin-off of OpenVPN Technologies, the developer behind the open-source OpenVPN software suite. This is a popular alternative to the L2TP/IPsec and PPTP protocols used to tunnel traffic through encrypted internet links.

There are three principle VPN protocols in common use today. The weakest is PPTP, developed by Microsoft and generally considered to be wide open to nation-state intelligence agencies and gifted hackers. Then there's IPsec over L2TP, a popular choice but with question marks raised by respected security experts since its release in the 1990s, when it was developed by committee with the NSA.

This leaves OpenVPN as a possibly secure VPN protocol. It is an open-source implementation for virtual private networks based on SSL/TLS key exchange, followed by symmetric ciphers to transport user data. But since it's based on OpenSSL, the OpenVPN system cannot be seen as bulletproof in its security, as 2014's Heartbleed vulnerability very publicly showed.

It's worth adding that Private Tunnel swiftly announced after the initial Heartbleed disclosure that its implementation of OpenVPN included perfect forward secrecy (PFS), such that an adversary can only access captured data from one decrypted session. In other words, to have your VPN link compromised the session key must be cracked each time you use the service.

Private Tunnel has an unusual business model in its commercial VPN service. Rather than sell you VPN server access by the month, it meters the data that you use. So you simply need to top-up your account with however much data you need.

The first hit of 100MB is for free. That's handy, to enable you to try with no obligation to see if the service works for you. Thereafter data packages are sold at \$12 (£8) for 50GB, \$20 (£13.40) for 100GB and \$50 (£33.50) for 500GB. According to Private Tunnel, and 'average' user transfers around 90- to 120GB per year, although it's not clear if

that's a median, mode or mean user. Traffic is measured as the sum of up and download data. Alternatively you can try referring other people to the service. For every person you get to use the service, you receive 200MB for free. And thereafter for every data purchase they make, you get 10GB added to your account.

Server choice is much more limited than most other services. We counted three US servers (New York, San José and Chicago), and one each in the UK, Switzerland, Canada and the Netherlands.

Using the New York server, we measured 26Mb/s download and 16Mb/s upload, a good transatlantic result even if latency rose to an understandably higher 78ms. Moving ourselves back to London we hit 50Mb/s down and 43Mb/s up, with 25ms ping.

Software

Private Tunnel only officially supports its own proprietary software to connect to its VPN servers, and this is available for Windows and OS X. Dig more deeply into its website and you learn that you can use other platforms, providing there is existing OpenVPN software support. For Mac users, for example, there is the open-source Tunnelblick interface released under GPLv2. To enable this you will still need to download your personal profile as a .pvn file from the Private Tunnel website, and import this into your system.

The provided software is minimalist, just providing a means to log in and authenticate, and switch between the seven available server locations. There is a Settings tab in the program's interface, but whenever we clicked on it we were instead logged out of the service.

Most troubling though is a data leak in the Mac OS X version, which makes a connection to Google's servers without even the benefit of an encrypted tunnel. When we reported this to the company we were told its engineers were now addressing these issues and plan to have a fix in the next release due late March 2015.

VERDICT: Private Tunnel provides a minimalist software client for its users of Windows PCs and Mac. Server selection is sparse but those we tried were suitable fast. If you value your privacy, you may like to avoid the OS X issue until its data leak has been plugged.

Conclusion

Prices quoted in our table are for one month, which may be useful to try the paid-for service before committing to longer periods that will work out cheaper – often significantly cheaper.

If your needs for VPN only extend to keeping your Facebook session cookies safe, and thereby your login details, while surfing in Starbucks then any of the tested services should keep you clear from casual hackers. If you are looking for a VPN service to help reduce the amount of unceasing online tracking by data harvesters and advertising companies, then you may wish to avoid the proprietary software of service providers which dial out to Google servers or rely on Google APIs. When we asked about this, CyberGhost told us it was moving away from using Google Fonts; HMA! was satisfied that user privacy was not being compromised; while Private Tunnel told us that it is now closing the leak in a new version due to be released later in March 2015.

If you're looking for a VPN service that is less subject to government surveillance, the US-run services are in some respects a surprisingly reasonable choice since the USA does not mandate that

these service providers must keep records of users log in/out times or worse. So most US VPN providers will declare they do not log. This includes the IPVanish and Private Tunnel services reviewed here.

However, US companies are bound by federal law such as the Patriot act, which allow wiretaps on their customers, and are forbidden from telling anyone that this is happening. So doing business with any US internet or communications company always carries this risk.

In Europe, the Data Retention Directive 2006/24/EC has been overturned by the European Court of Justice, and nations are no longer required to log user activity. They must ensure they do not implement any law or procedure that infringes our rights to privacy given in the European Union of Fundamental Rights. The UK is an exception after the DRIP Act of 2014, which requires UK companies to log their customers' activity and turn over these logs on demand.

With jurisdictions in Panama and Italy, the services from NordVPN and AirVPN would seem to offer a more assured service of privacy, and should be better placed to make the 'P' for private in VPN mean something. ☒

	AIRVPN €7 (£5.20) per month ★★★★☆ PC ADVISOR BEST BUY	CYBERGHOST VPN \$7 (£4.70) per month ★★★★☆	HMA! PRO VPN £11.52 per month ★★★★☆
Company location	Perugia, Italy	Bucharest, Romania	London, UK
Logs	No	No	Yes
VPN protocols	OpenVPN	L2TP/IPsec, Open VPN, PPTP	L2TP/IPsec, Open VPN, PPTP
Number of concurrent devices	3, to different servers	5	2
Data allowance	No limit	80 GB total data per month, currently not measured	No limit
Client software	Windows, OS X	Windows, OS X	Windows, OS X, iOS, Android
Platform support	Linux, Windows, OS X, DD-RT, Tomato, pfSense, TOR, SSH tunnel, SSL tunnel	Windows, OS X	Linux, OS X, Windows, iOS, Android, DD-WRT,
Manual configuration option	Yes	Yes	Yes
P2P policy	Allowed	Blocked on some servers (free service)	Not advised

	IPVANISH \$10 (£6.70) per month ★★★★☆	NORDVPN \$8 (£5.40) per month ★★★★☆ PC ADVISOR RECOMMENDED	PRIVATE TUNNEL \$12 (£8) for 50GB ★★★★☆
Company location	Orlando, Florida, USA	Republic of Panama	Pleasanton, California, USA
Logs	No	No	No
VPN protocols	L2TP/IPsec, Open VPN, PPTP	L2TP/IPsec, Open VPN, PPTP	OpenVPN
Number of concurrent devices	2	2	No limit
Data allowance	No limit	No limit	Depends on amount purchased
Client software	Windows, OS X	Windows, OS X	Windows, OS X
Platform support	Linux, OS X, Windows, iOS, Chrome OS, Android, DD-WRT,	Linux, OS X, Windows, iOS, Chrome OS, Android, DD-WRT, Raspberry Pi	Linux, OS X, Windows, iOS, Android, DD-WRT,
Manual configuration option	Yes	Yes	Yes
P2P policy	Allowed	Allowed	Allowed but potentially expensive

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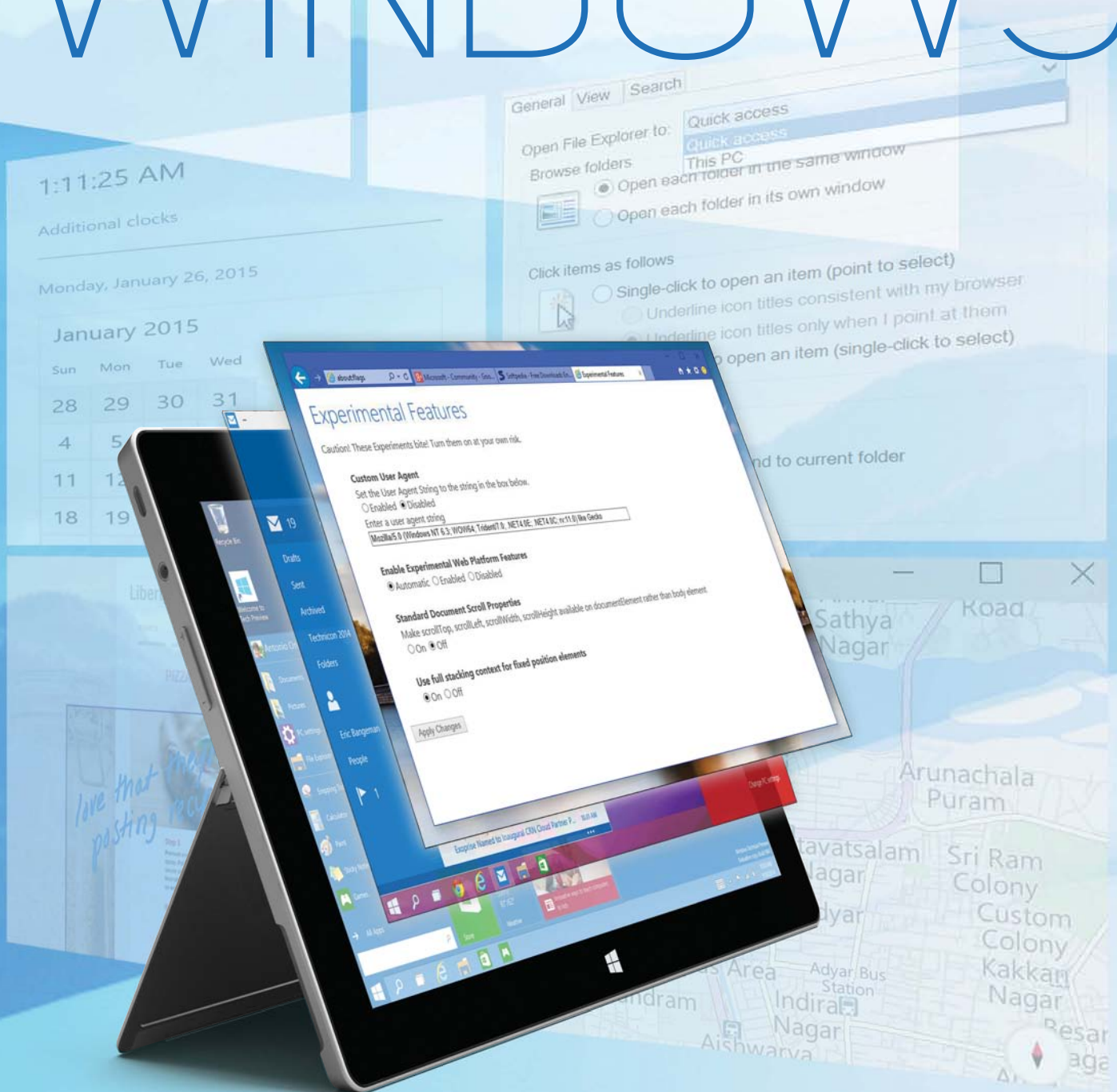
Our service will help you get a great price in a safe and secure way for both new and old Apple products. For added piece of mind, all refurbished devices bought through the store come with a product warranty. But don't just take our word for it – get an instant, no obligation quote now.

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DIG DEEP INTO NEW WINDOWS



10 FEATURES

WINDOWS 10 MAY STILL BE IN BETA, BUT IT ALREADY HAS SOME FUN AND HANDY HIDDEN NEW FEATURES WORTH EXPLORING

Despite still being very much an early preview, Windows 10 is already brimming with dozens of handy tweaks and tricks – and, because the operating system is still in preview, a handful of those tricks unlocks powerful functionality hidden to everyday users.

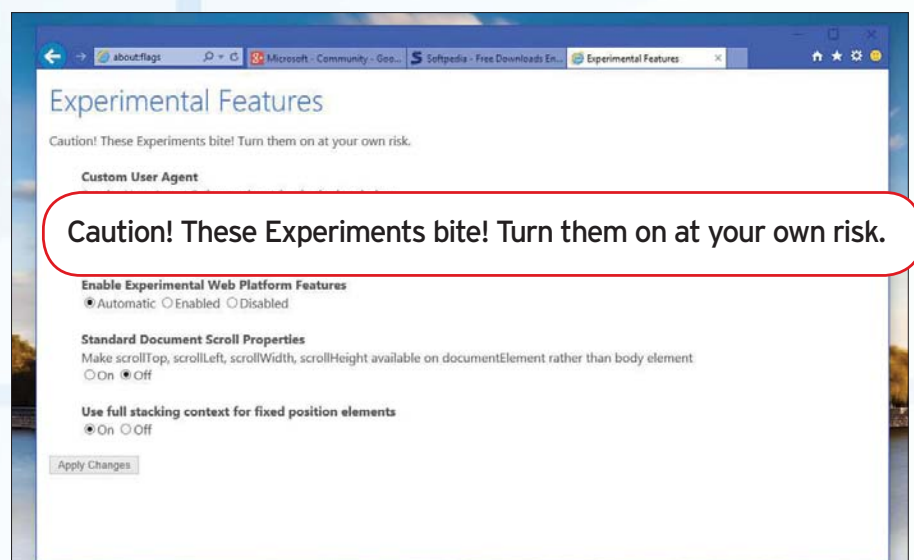
Others, though, simply let you mold some of Windows 10's new features into the shape you see fit. Here are some of the most useful Windows 10 tweaks, tricks, and tips we've found. Be warned: Some of these may break as the operating system evolves.

This is(n't quite) Sparta(n)

Let's start by unlocking one of those powerful new features. Microsoft's building a lightweight new browser for Windows 10: Project Spartan. And while Spartan isn't available in the latest Windows 10 builds yet, you can enable its experimental Edge rendering engine in Windows 10's Internet Explorer 11.

Just open IE11 and type **about:flags** in the address bar. In the page that appears, simply set 'Experimental Web Platform Features' to Enabled, then restart the browser. Setting the 'Custom User Agent' string to Enabled as well will trick websites that use the old IE engine into using Spartan Edge.

The Edge engine is considerably faster than Internet Explorer 11's default engine in tests, but be warned: It's flagged as experimental for a reason.



Make Cortana's ears perk up

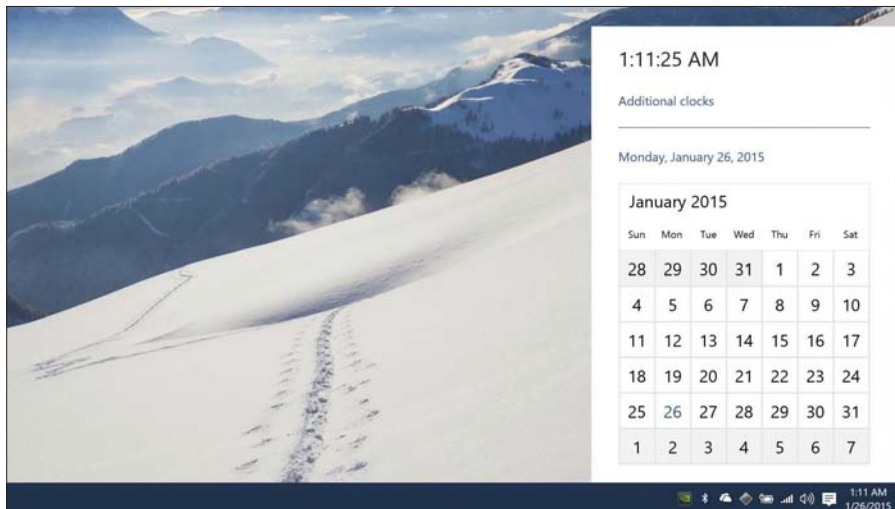
Cortana has finally made the leap to the computer in Windows 10, assuming many of the operating system's search functions, even though her first iteration could still use some polish. (That's what Previews are for.) But by default, it doesn't listen for your commands.

If you'd like to be able to just bark commands at your PC, open Cortana by clicking the search field in the taskbar and select the three-lined options menu in the upper-left corner. Select Settings from the list, then simply enable the Let Cortana

Windows' **EXPERIMENTAL FEATURES** come with a warning

respond when you say 'Hey Cortana' option. You'll need an active microphone for this to work, of course.

While you're poking around Cortana's options, you can dive into the Notebook menu to fine-tune what personal data Microsoft's digital assistant can access. However, like Google Now, Cortana's effectiveness is directly related to how much she knows about you.



A simple **REGISTRY EDIT** will you open the clock and calendar functions from the Taskbar

Revamped clock and calendar

Let's activate Windows 10's sleek new clock and calendar. Here's how, as first discovered by Winbeta (winbeta.org). It requires a (simple) Registry edit, so be sure to make a backup first (tinyurl.com/nmgtkog).

Right-click on the Start button and select Run. In the window that appears, type **regedit** and then press Enter. Navigate through the file system to HKEY_LOCAL_MACHINE > Software > Microsoft > Windows > CurrentVersion > ImmersiveShell, then right-click in an empty portion of the main windows and select New > DWORD (32-bit) Value. Name it UseWin32TrayClockExperience and you're ready to go. Just open the calendar from the taskbar as normal and enjoy the sleek, new look.

Declutter your taskbar

Two of Windows 10's standout features are its Cortana search integration and newly added virtual desktop support. Unfortunately, they claim a sizeable chunk of your taskbar. If you don't care about either (or don't mind using Windows key + Tab to leap through virtual desktops), you can reclaim that on-screen real estate.

Everything starts by right-clicking an empty section of your taskbar. In the menu that appears, deselecting Show Task View eliminates the Task View (virtual desktop) icon, while selecting Search > Disabled removes Cortana's 'Ask me anything' box.

Fresh keyboard shortcuts

Windows 10 packs a handful of fresh keyboard shortcuts, all tied to newfound abilities inside the revamped operating system. There are many more than we can list here, so head over to our sister title PCWorld's guide to

Windows 10's keyboard shortcuts (tinyurl.com/qxh4e8L) to learn all about them.

Secret, powerful new command line tools

Windows 10 packs a slew of nifty new command line features, including the ability to copy and paste inside the command prompt with Ctrl-C and Ctrl-V.

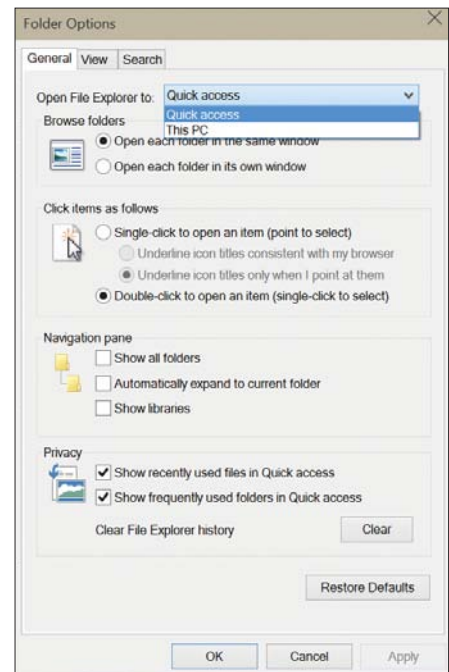
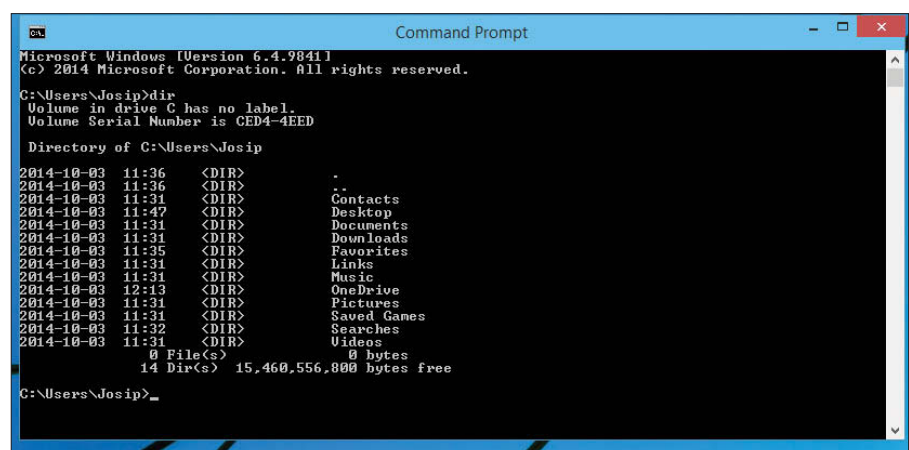
To activate these, open the command prompt. Right-click its title bar, then select Properties. You can find and enable the new features under the Experimental tab.

Disable the Photos app's auto-enhance

Windows 10's Photos app has been rebuilt as a universal app that scales across device types. It's still more than a bit buggy, but one notable feature already stands out: it will automatically auto-enhance your pictures for clarity and punch.

If you'd rather Photos left your pictures alone, open the app's Settings - symbolised by a gear in the left-hand column. Under the Viewing and Editing section, simply disable

New command line features
INCREASE CUSTOMISATION



Turning off the **QUICK ACCESS** view is straightforward

the 'Automatically enhance my photos when they can be improved' option.

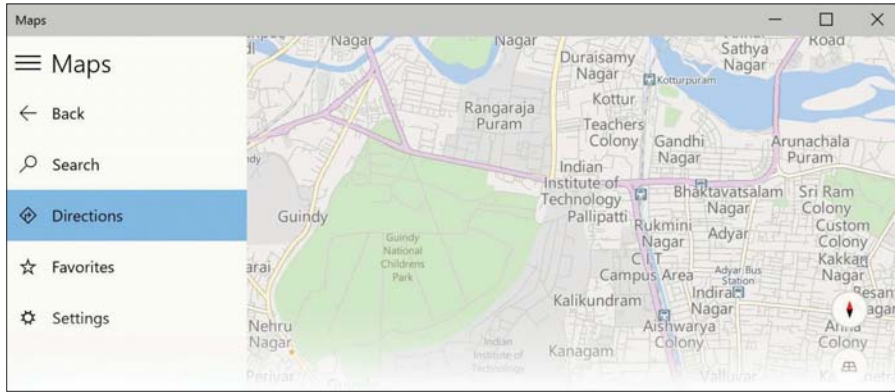
Turn off File Explorer's Quick Access view

When you open File Explorer in Windows 10, it defaults to a new Quick Access view that shows your most frequently accessed folders and recently viewed files. If you'd rather File Explorer defaulted to the 'This PC' view found in Windows 8, here's how.

Open File Explorer, then select View > Options from the Ribbon. A Folder Options window will open. Click the Open File Explorer drop-down menu at the top, then select the This PC option. Click OK and you're done.

Offline Maps

Speaking of apps, the revamped universal Maps app, like any maps tool worth using packs an offline maps feature. Click the



You'll be able to select which continent, then country whose **OFFLINE MAP** you'd like to download

Settings (gear) icon in Maps, then select Download or update maps under the 'Offline maps' header.

You'll be bounced to the Settings app, where you'll be able to select which continent, then country whose offline map you'd like to download. Helpfully, Windows tells you how large the download will be before you start scraping the maps.

Enable tablet mode

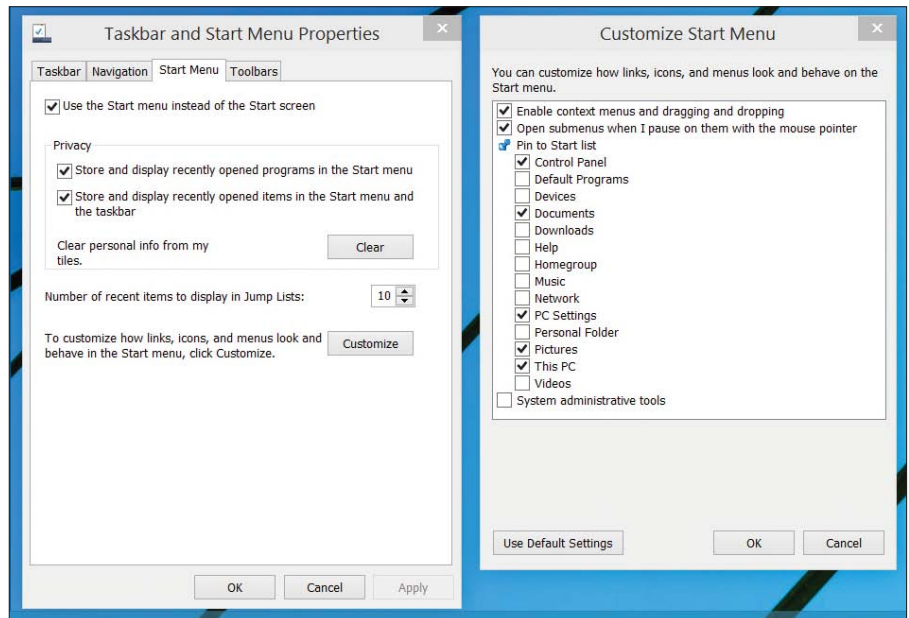
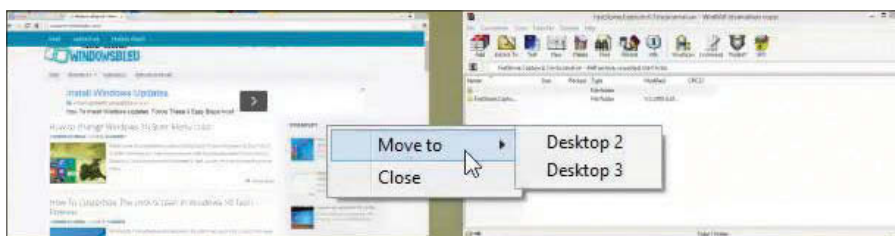
Windows 10's Continuum, which dynamically switches from the traditional desktop to a more Metro-like interface when you're using a touchscreen, is supposed to kick into action when you connect or disconnect a keyboard from your Windows hybrid or tablet. But what if you're using a standard PC and love full-screen apps and the Live-Tile-strewn Start screen, rather than the Start menu?

Activate tablet mode. Open up Windows 10's new Action Center - the small icon that looks like a comic-book word bubble in your system tray - and click the Tablet Mode button. It'll turn blue, the desktop will darken, and Cortana's desktop box will shrink to an icon to indicate you've made the switch. Now bask in the full-screen apps and Start menu, since that's obviously your thing.

Move open applications between virtual desktops

Virtual desktops let you segregate your open apps into discrete areas - multiple, virtualised versions of your PC's desktops. Switching between open virtual desktops is easy enough using Task View or Windows

You can now segregate your open apps into **DISCRETE AREAS**



key + Tab, while Alt + Tab jumps you between open apps across all desktops. There's also a way to actually shift an open app from one virtual desktop to another if you'd like to shuffle things around.

Simply open the virtual desktop housing the open app in question. Click the Task View button in your taskbar - it looks like two papers in front of one another - to bring up an overarching view of your open desktops as well as the open apps inside this virtual desktop. Right-click the program you'd like to move, then select Move to > Desktop [desired virtual desktop number].

Customise your Start menu

Finally, don't forget to make the Start menu your own. If you appreciate the blend of the traditional interface with the Live Tiles, note


Personalise both the **TASKBAR AND START MENU** interfaces

system. Repopulate them with desktop software of your choosing - you can right-click any app or program and select Pin to Start - and before you know it, it'll be like the Windows 7 Start menu all over again.

Expand the Start menu to full-screen

If you like the look of the full-screen Start menu but still use a mouse and want to stick to windowed Metro apps, fear not. Open the Start menu, click the Expand Start button in the upper-right corner to have it mimic the Windows 8 Start screen (and the picture in the previous slide) every time you click the Start button. The rest of the desktop continues to behave normally.

Try it yourself

If you want to get in on all this cutting-edge action yourself, check out our guide on how to install the Windows 10 Preview (tinyurl.com/K79obn8) for everything you need to know to start using the OS today. 

WINDOWS 10 ***FOR PHONE***



With the launch of Microsoft's upcoming operating system we'll soon be waving goodbye to Windows Phone. But how do the two compare? In our preview, [Chris Martin](#) explains everything you need to know

Windows 10 is launching later this year and that's exactly what it will be called when it arrives on smartphones; not Windows Phone 10, despite it seeming like the natural progression (there is no Windows 9). In this feature, we're going to look into every aspect of Microsoft's upcoming mobile operating system, including its new features, apps and user interface.

When you first use Windows 10 for phones, you'll find that it introduces a number of new options. These include full-size art for the Start screen, an improved Action Center, interactive notifications, better speech-to-text and an enhanced Photos app. The operating system will be a free upgrade for smartphones, tablets and PCs. As you would expect, selected Lumia handsets currently running Windows Phone 8 will be included. Smartphones running Windows 10 out-of-the-box will arrive later this year, and include the Lumia 640 and 640 XL.

Following its January launch event, Microsoft has made a Windows 10 Technical Preview available for a handful of devices. We've been using this on a Nokia Lumia 830 alongside a laptop running Windows 10. As the name suggests, the build is not final and this should be kept in mind.

What happened to Windows Phone?

Windows 10 is built to run across all manner of devices and is the same core platform for computers, tablets and phones. No matter what you're using, it's a shared codebase. Indeed, Microsoft's tagline for the new operating system is: "One product family, one platform, one store."

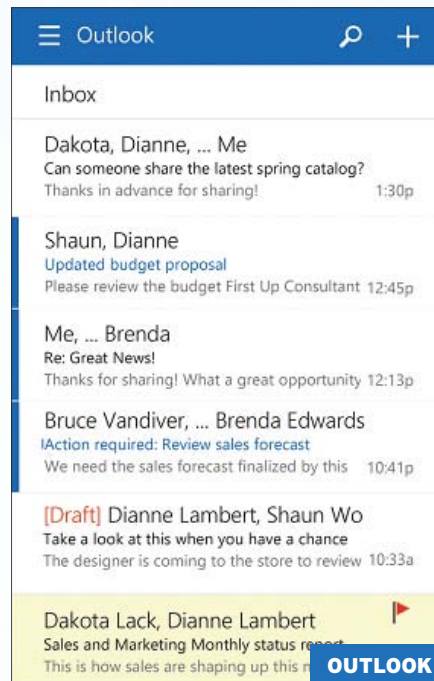
That said, using Windows 10 on a phone is a similar experience to Windows Phone 8. As well as a common operating system core, Microsoft has switched to using the same app platform across PCs and handsets.

Don't, however, be fooled into thinking that just because it's the same operating system as laptops and desktops, you can run full x86 programs on your phone.

App updates

Outlook/Mail

Outlook is one of the first 'universal apps', meaning it will run across your PC, laptop, phone and tablet, with the same experience. It should also synchronise everything seamlessly. As long as you're connected to the internet in one way or another all the information will be updated instantly. You could, for example, start replying to an email on your laptop, then finish it on your phone



while you're on the go. In general this is the same for any universal app.

As you'd expect, Office is a part of Windows 10 on phones just like it was in Windows Phone 8. When it arrives, Word will be integrated with Outlook, so you can format your emails nicely, even on a phone, and add things such as tables. Swiping left and right on messages deletes or prioritises them.

There's full Gmail support, as well as other webmail service across phones, tablets and PCs. In fact, there's much better support for all webmail services, so you don't have to be an Outlook user with an Outlook address to benefit.

Office

Although they are not included in the Technical Preview that we're running, Microsoft has confirmed its Office team has built new features into new universal apps for Word, Excel and PowerPoint.

They are optimised for touch-based input and will include the Office Ribbon, which desktop users have become familiar with. Your recent documents list will also be available across all your Windows 10 devices.

Calendar

Calendar will be a universal app and it will be integrated into Outlook, too. It's not part of the Technical Preview build, but the app will synchronise across all your Windows 10 devices. This means it doesn't matter which one you enter an event on, it will show up everywhere.

One view in the Calendar app will give you an overview of the week, indicating how busy each day is, with details of specific entries below in chronological order.

Photos

The updated Photos app will also work across all your devices, and has been improved with better editing and management tools. This makes it easier to find the image you're looking photo and give it a few tweaks before sharing it. The app automatically enhances photos and removes duplicates, too.

On the video side of things, you can easily scrub through a clip if you're trying to find a particular bit without having to simply guess how far in it is.

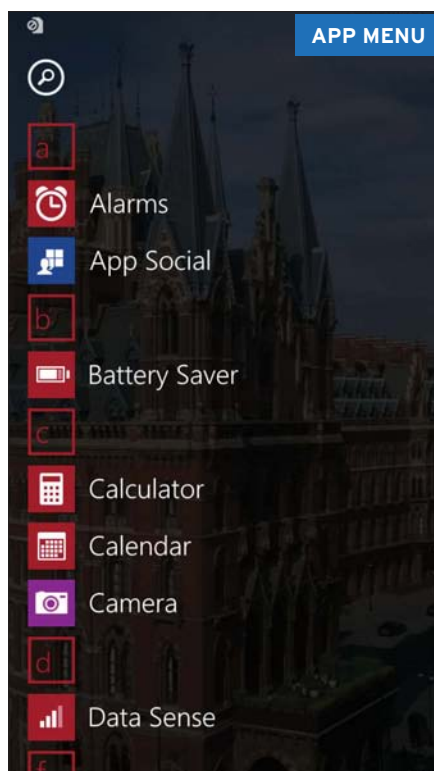
Photos displays your shots in chronological order in the same tiled layout as that found in Windows Phone, 8 and you can choose whether or not to show photos and videos from your OneDrive. This means you won't need to head to it as a separate app to access that content.

One feature that's set to be introduced is Albums. This will enable you to group photos into themes, edit them and then share them with friends without using Facebook or photo sharing sites such as Flickr.

Maps

The current situation for mapping on Windows Phone 8 is somewhat confusing,





with both Maps and HERE Maps (developed by Nokia) onboard. Going forward things will be different in Windows 10 with a Maps universal app.

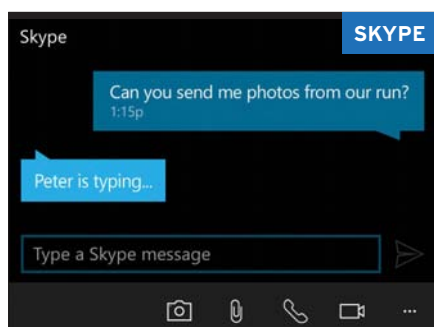
The experience will be the same across all your Windows 10 devices. Bing Maps will be used for its search results, Streetside views will offer 3D imagery and there will be new navigation options.

Messaging and Skype

There's a big change when it comes to messaging because Microsoft has decided to combine phone calls, text messages and Skype (both messages and calls). There's a new dialler, but Messages is the focus for Windows 10 on phones.

In a similar way to iMessage and Google Hangout, the Messages app will display all the content in one conversation thread view - whether it's a regular SMS message or from Skype. Users can also quickly exit the thread and call the person easily.

Furthermore, the related People app (where you store all your contacts) will allow you to choose a preferred method of

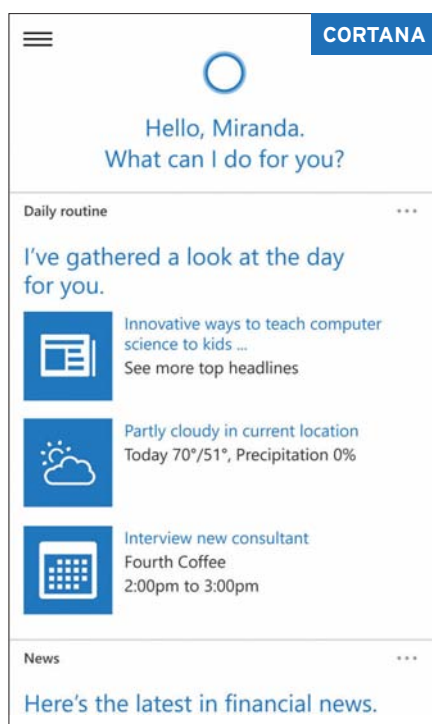


communications - whether that's email, text or internet messaging.

Cortana

Microsoft's digital assistant - Cortana - is a little different on the Technical Preview. In fact, it's limited to US- and English-only, and some of the existing features available via Windows Phone 8.1 aren't yet enabled in the new codebase.

Eventually, Cortana will be more powerful and capable with more skills and language support. We're hoping that dictation will be opened up to more uses, such as email. The blue circle that represents Cortana on the screen will also change, depending on what you ask and different situations - the aim being to give it 'personality'.



As with many features in Windows 10, the idea is to have consistency across devices. So if you set a reminder on your phone, it will potentially pop up on your desktop at the right moment. The more you use Cortana, the better it gets to know you. According to Microsoft, this will help it provide more personalised information.

Spartan browser

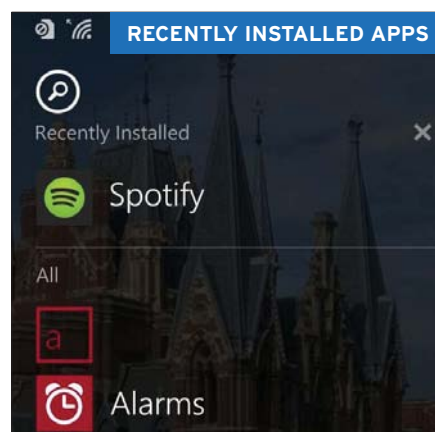
Project Spartan is Microsoft's new web browser and will eventually replace Internet Explorer. It's designed for the modern web and has a new look and feel. New features include the ability to annotate articles before sharing them. There's also a customisable reading mode that supports PDFs and a reading list, which will show up on all your Windows devices. Last but not least is its integration with Cortana, which will help you find things on the web easier and faster.

User interface changes

Many of the changes in the Technical Preview of Windows 10 for phones relate to the user interface. As we've mentioned already, it's not a massive departure compared to Windows Phone 8, so existing users will have no problems finding their way around, but will benefit from the tweaks and improvements listed below.

Recently installed apps

The usual apps menu sits to the right of the Start Screen and still shows all of your apps in alphabetical order. However, a



new section will appear at the top called 'Recently Installed' showing newly installed apps, which is handy.

New tile art

Since smartphones are personal, Microsoft has made various improvements to the Start Screen on handsets to make it more



customisable. For example, with Windows 10 for phones, you can select an image that will appear full-screen behind the tiles and the apps menu. Tiles that don't have a solid colour are semi-transparent, so you can see the image behind.

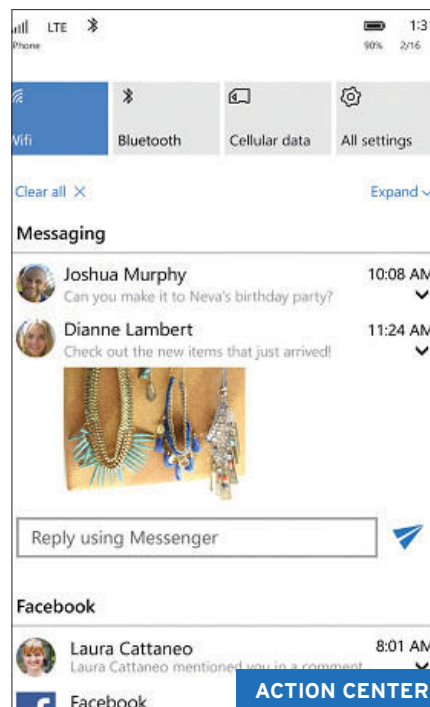
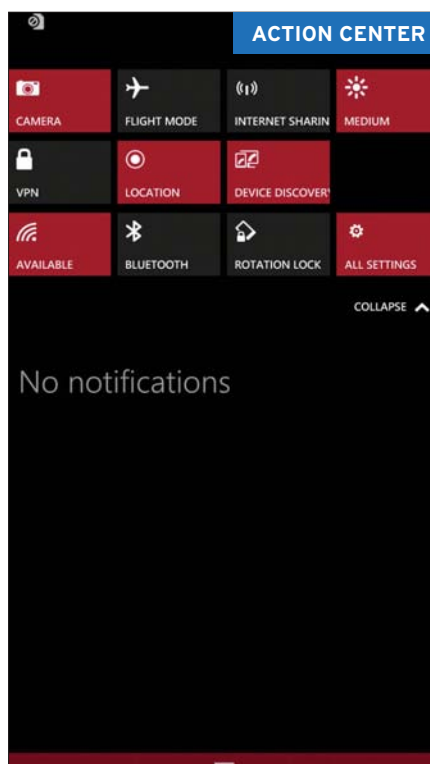
Improved Action Center and Interactive Notifications

We were glad of the arrival of the Action Center on Windows Phone 8 and Microsoft has made some nice improvements in Windows 10 for phones.

It's a little buggy on our Technical Preview, but more Quick Actions are available, so when you pull the bar down from the top of the screen you'll see the usual set of four. There's also a new expand button, which shows eight additional Actions when clicked. Previously there was a simple link to all settings and you can still select which four you wish to be the primary ones.

Action Center is also where you pick up all your notifications and while they are displayed in the same manner, they are now interactive. This means you can do various things straightaway. For example, you can dismiss an alarm, and when it comes to things such as text messages, you can reply inline via the keyboard or voice.

Another new features that's worth mentioning is that you won't need to dismiss notifications twice. If you get rid of one on your phone, then you shouldn't have to deal with it again if you switch to Windows 10 on another device. That's a real boon and something that we've been wanting on iOS and Android for some time.



New Settings menu

Long suffering Windows Phone users will be pleased to hear that the Settings menu has received a much needed overhaul. The existing one has been split into 'system' and 'applications', which is no bad thing as the massive list of options was extremely difficult to navigate with no apparent order or method.

The new Settings menu is divided into 10 sections for things such as system, personalisation, accounts and privacy. It makes much more sense, and under each heading you can see what type of things you'll find there. However, what we'd like is the ability to search the entire menu just you can do with the apps, so hopefully this will be added in the final build.

New keyboard with joystick

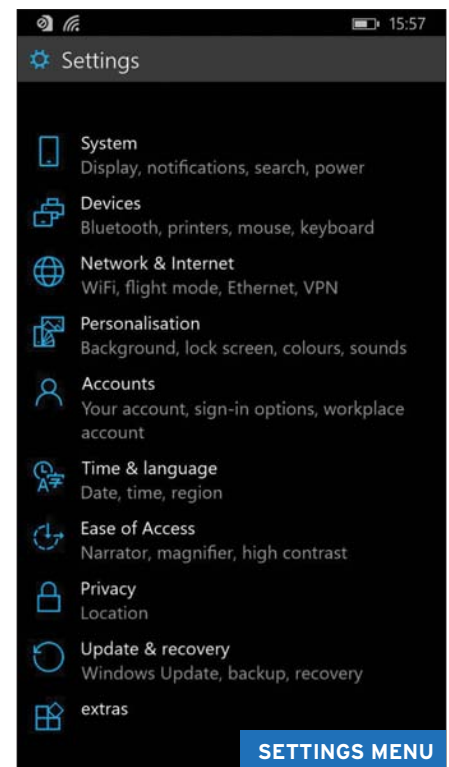
The keyboard is largely the same in Windows 10 compared to Windows Phone 8, but there's a new feature that you might not even spot at first.

If you remember the way old IBM laptops had a tiny joystick in the middle of the keyboard for moving the cursor - often called a nipple - well that's exactly what Microsoft had added to Windows 10 for phones in a virtual way.

Rather than sitting in the middle of the keyboard, it's on the left-hand side between Shift, Z, the 123 button and semicolon. If you tap and hold it a little D-pad pops up and you can slide your finger around to move the cursor - it's pretty neat.

Verdict

There are some nice user interface tweaks in Windows 10 for phone, which makes it



much more pleasurable and easy to use, but we're not talking about a massive departure from Windows Phone 8. Unfortunately a lot of the key features are missing from the Technical Preview, so we'll have to wait and see how it pans out. Key to its success are universal apps, which will supposedly work seamlessly across all Windows 10 devices. That sounds great if you're going to jump in headfirst and commit to Microsoft's new operating system. ☒





Office ONLINE

VS



Office 365

WHAT'S FREE, WHAT'S NOT AND WHAT YOU REALLY NEED
BY BRAD CHACOS

Microsoft Office, once an expensive investment (or furtive appropriation), is now available in free as well as paid forms, on basically any device with a screen.

And the goodies keep coming. The original, browser-based Office Online has steadily gained features. Microsoft also recently revealed that Office for Windows 10 apps will be preinstalled and free to use on Windows 10 smartphones and small tablets - joining native, free apps that already exist for iOS and Android.

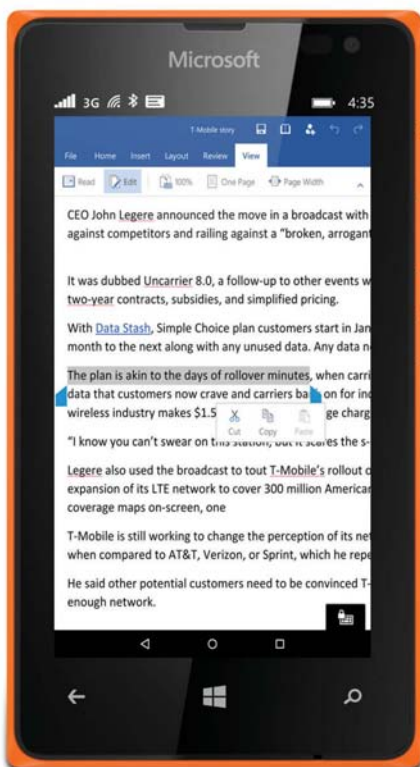
At the same time, Microsoft has added a number of perks and incentives that make the subscription-based Office 365 a very attractive upgrade.

The challenge is no longer access, but choosing the right version for you. Here's how to decide which to use.

WHAT'S FREE

Office Online offers the core four: Word, Excel, PowerPoint and OneNote. This is the same as you'd get with the Office Home and Student 2013 suite. You can also use Outlook.com for email rather than paying for Outlook. Factoring in all five, you have the equivalent of the Office Home and Business 2013 suite - for free.

With both the Office Online apps and the Office apps for mobile devices, though, the versions that Microsoft provides for free have limited functionality compared with the paid equivalents.



For example, if you compare the Home ribbon in Word Online with the Home ribbon in Word 2013, the two are almost identical. You can copy, cut and paste, change the font characteristics, and so on. A few features you might miss: Word Online lacks the Format Painter feature that lets you copy formatting from one section to another, and it doesn't have a few of the font options, like Text Effects and Typography, or Change Case.

Word Online has the basic paragraph formatting options, including bulleted or numbered lists, and the ability to align text left, right, or centre. However, it doesn't have some of the features available in Word 2013, such as shading, borders or multilevel lists.

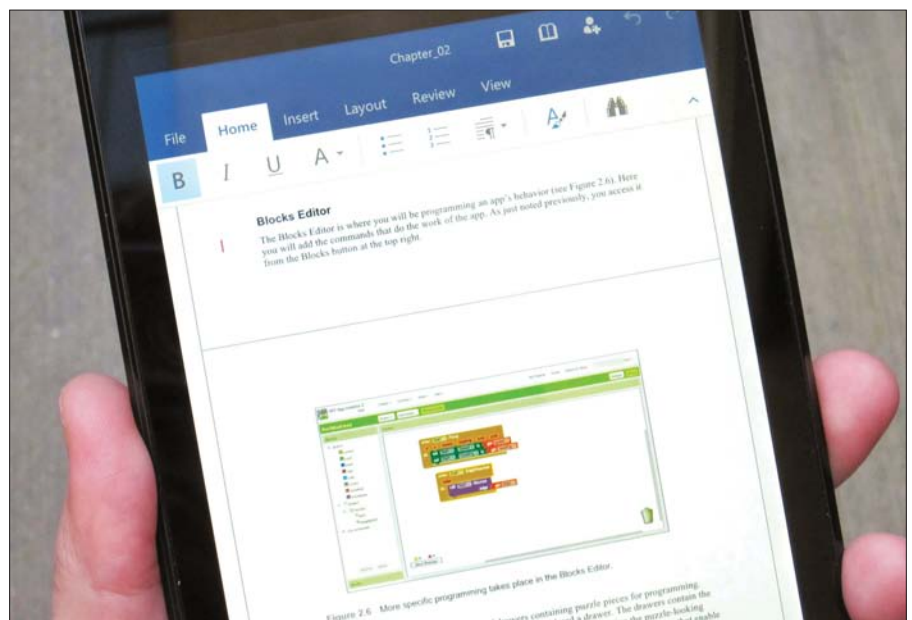
Where the real difference comes in, though, is the ribbon options that simply don't exist in Word Online. If you look at the tabs across the top of the ribbon,



you'll see that Word 2013 has two tabs that you don't find in Word Online: References and Mailings. Mailing allows you to print envelopes and labels and manage mail merge printing of Word documents. References contains features you need for more advanced documents - things such as table of contents, citations and bibliography, captions, index, and table of authorities. Footnotes is also part of the References tab in Word 2013, but it's available in Word Online under the Insert tab.

With the mobile apps, users can view, create, and edit Office documents for free, and sync those files with Microsoft OneDrive or Dropbox cloud storage. However, only paying customers are able to do things like change track or accept changes, or format text into columns.

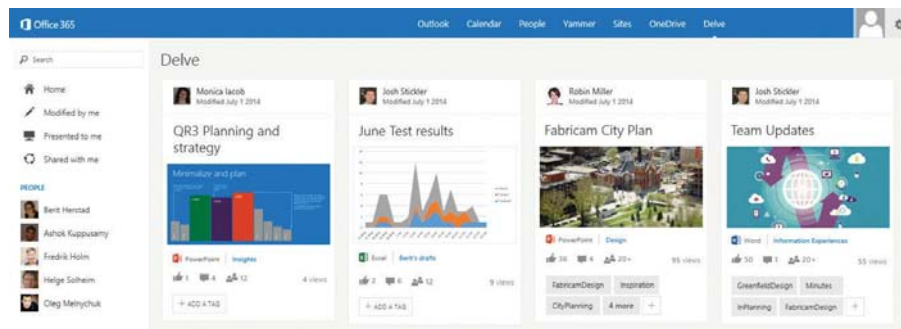
OFFICE FOR ANDROID shipped in January, joining Office for iPad as a free, native app for mobile users



WHAT'S NOT

If you need more than basic document creation and editing capabilities, the free Office Online apps aren't for you. Getting access to the more advanced functionality requires investing in the Microsoft Office suite.

Microsoft offers Office 365 Personal and Home subscriptions, as well as a variety of plans for businesses of all sizes. Office 365 Personal is £5.99 per month (or £59.99 per year). Office 365 Home costs £7.99 per month (or £79.99 per year) and can be shared by up to five individuals. Office 365 business plans include some features aimed specifically at business users, and are billed differently – starting at £7 per user per month if you want the full Microsoft Office suite.



No matter which of these Office 365 plans you choose, each user also gets the full Office Professional 2013 suite for either a Windows or Mac PC. The Office 365 subscription also unlocks the full functionality

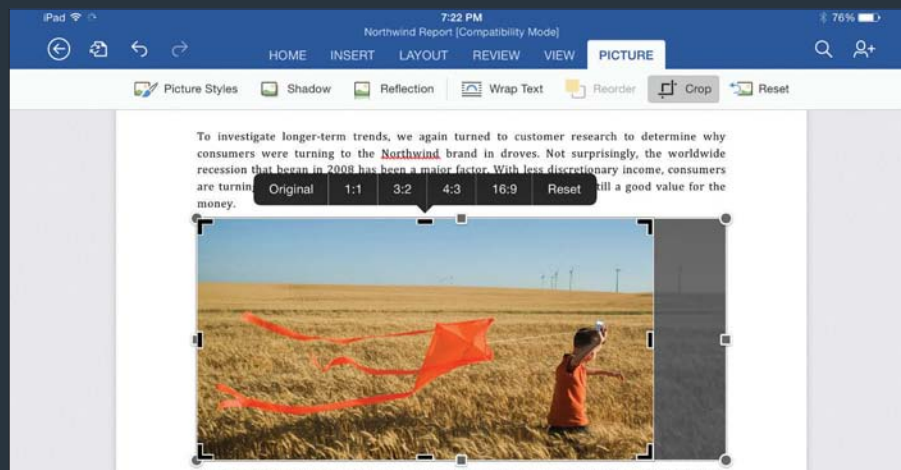
of Office on a tablet or smartphone and provides additional perks like Skype calling minutes and unlimited OneDrive storage instead of the 15GB Microsoft provides for free OneDrive accounts.

WHAT YOU REALLY NEED

The Office Online applications are enough for most people. Word, Excel, PowerPoint, and OneNote cover the things the vast majority of people use from the Microsoft Office suite. Factor in Outlook.com, and the free Office Online tools seem to cover the bases.

The free Office mobile apps have limited capabilities. They allow users to create, view, and edit files and include the basic features most users rely on.

If you need Access or Publisher, though, Office Online won't work for you. In order to get either of these apps as part of a suite, you have to buy Office Professional 2013, or subscribe to Office 365, which comes with the rights to install Office Professional 2013 on multiple machines. And if you want to be able to do things such as change the orientation of a document, insert section breaks, or other advanced functions from a tablet or smartphone, you'll have to sign up for Office 365.



The question you have to ask yourself is whether those features matter. We've spent the vast majority of our waking hours in Microsoft Word for more than a decade. We have never – not once – used the features

under Citations and Bibliography, or Index, or Table of Authorities, and have never performed a mail merge. The only feature missing from Word Online that we do use on a fairly regular basis is the Table of Contents.

SIZES TO FIT ALL

The verdict? Simple: Office Online tools are more than adequate to meet needs of most users. The only serious handicap to keep in mind is that you must be connected to the Internet in order to use Office Online, whereas the locally installed Microsoft Office suite is available for use regardless.

That may not be a deal-breaker in and of itself. There are free public Wi-Fi hotspots all over the place, and how likely is it, really, that access to the Office applications while

you're not connected to the internet will be a crucial issue for you?

That said, the unlimited OneDrive storage alone is worth £5.99 per month, and the Skype minutes would cost around £1 per month to purchase separately. When you add up the perks in Office 365, it's like you're actually getting Microsoft Office for free, and still getting a discount on the additional features as well.

A number of features and perks come with Office 365, and we still highly recommend

subscribing to the service, but the reality is the vast majority of users can get by just fine using the completely free Office Online.

You'll have even more choices soon. Microsoft announced that Office for Windows 10 and Office 2016 will be released later this year. We don't yet know what new features or capabilities will be included in the touch-friendly Windows 10 apps, nor the new version of the desktop suite, or whether any of that will bleed over to the free Office Online offerings. ☐

A NEW KIND OF PC:

HP SPROUT

MELISSA RIOFRIO PUTS GET'S HER HANDS ON HP'S SPROUT, AN IMAGING POWERHOUSE BUILT INTO A TOUCH-FRIENDLY PC



The Sprout, HP's innovative new PC, towered above my desk. An array of cameras and a projector (collectively called the Illuminator) loomed over its 23in touch display.

I put a toy on the Touch Mat, a work surface extending from the front of the Sprout like a huge mousepad. Lights flashed from the Illuminator.

Shortly thereafter, a vivid image of the toy appeared on the Touch Mat. Using my fingers, I slid it onto an existing image. I

had just created a new picture, without ever touching a keyboard or a mouse.

With the Sprout, HP is inaugurating a new approach to computing called 'blended reality'. In plainer terms, it's a computer designed to work with imaging and touch technologies, paired with software that makes tasks more tactile and interactive. You can see how artists - and definitely kids - would enjoy working with their hands like this, even if the end results are still digital. Underneath it all lies a full-fledged PC that



To make a 2D image, the HP Sprout's Illuminator takes high-res images that turn into a **VIVID COMPOSITE**

can run all the traditional programs with a keyboard and mouse.

Here's the most intriguing part: the Sprout can also create 3D images of scanned objects. You can rotate and move the object, just as you might in a professional program such as AutoCAD. As HP continues to develop applications for the Sprout, you can see this capability figuring into, say augmented-reality applications, or even games.

The name may not be particularly informative, but the Sprout is a brand-new product and it definitely has some growing to do, but if HP is in this for the long haul, then it's got a big head start on its competitors, especially when it comes to 3D imaging.

The Touch Mat: A digital sketch pad

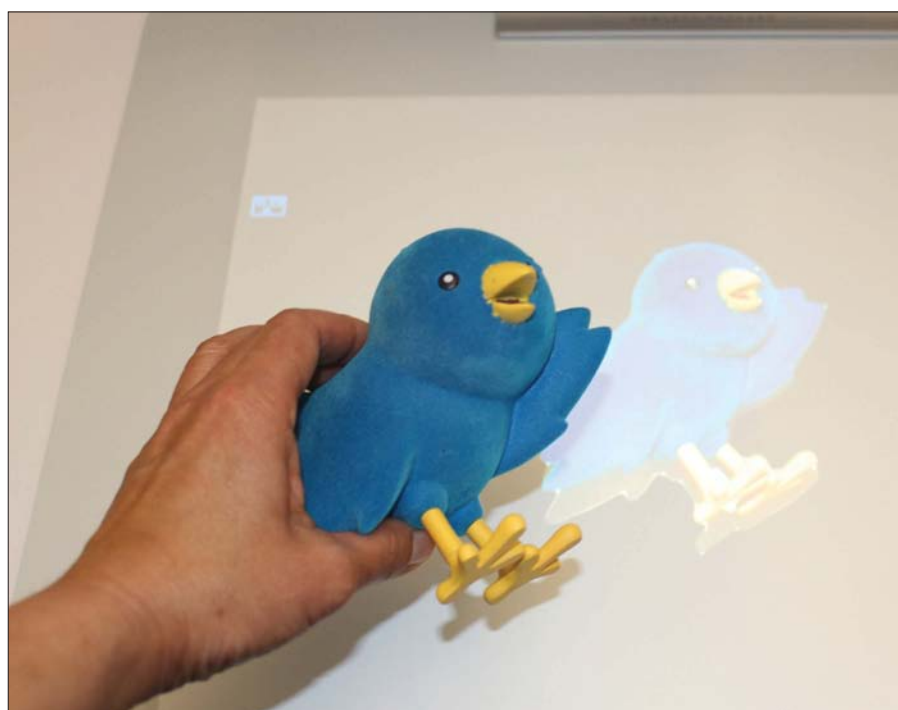
The Sprout's Touch Mat attaches to the main unit and acts like a second display. Its image is beamed from the overhead projector.

Think of it as a digital sketch pad. You control the Sprout's main imaging functions using the icons that appear along the top. Tools for specific activities appear along the left- and right sides.

You can take the included Adonit Jot stylus and draw a picture using the pen tools. You can choose different pen tips - a fine line, a calligraphy pen, or a marker pen - and choose the ink colour and line thickness.

It's somewhat like drawing on paper, except there's not much pressure sensitivity. Also, the overhead projector casts shadows

Scanned images appear on the Sprout's **TOUCH MAT**, where they can be moved around or manipulated





The HP Sprout's **3D CAPTURE TECHNOLOGY** uses Intel RealSense cameras to take multiple images of the object to build the final image

underneath your hand, which could obscure the area where you're drawing.

Taking 2D and 3D images with the Illuminator

Drawing programs already exist, as do photo-editing applications. The Sprout's touch interface and especially the Touch Mat make these tools feel more intuitive, but I realise some people still won't be impressed. The Sprout's image-capture technology is completely unique, however, as is the way its Workspace software pulls it all together.

I downloaded a photo of gargoyles from Notre Dame cathedral in Paris. Once an image is in the Workspace on the main display, you can 'flick' it on to the Touch Mat just as easily as it sounds: the image slides from the main display to the Touch Mat. You can move as many images there as you like and start using them to assemble your own creation.

Tool icons that appear on the right side of the Touch Mat let you move images to the 'front' or the 'back' (similar to the layering system in Photoshop), and tool icons on the left let you use ink and text tools to draw or write on the image.

In my case, I took the gargoyles image, then flicked down my image of the toy (the Twitter bird). I positioned it on the railing next to one of the gargoyles, and voilà: the Twitter bird was photobombing the Notre Dame gargoyles.

This may seem gimmicky, but think about what the gimmick means. The combination of the imaging hardware and the image creation and manipulation features gives you a lot of freedom to make things as banal as birthday cards or as fun as digital murals, all with the more natural feel of using your hands or a stylus.

Looking ahead to 3D printing, augmented reality

The Sprout's 3D image capture technology is still in beta as of this writing, and we'll delve into it further when we do a full review.

For now, the Illuminator can create a partial 3D image - basically, the top of an object. It comes out looking like a shell that you can rotate to see the underside.

The early apps that come with the Sprout show further potential. There's the Story Producer game, based on the animated

film *How to Train Your Dragon 2*: you choose different backdrops and characters, then their 'motivations', such as cheer or anger. The characters then act out a short scene accordingly.

You could get bored with this in two minutes, or you could see a future where you can put in your own backdrop, and 2D- or 3D-scan in your own characters, and set them in motion. Maybe you'd use the PowerDirector video editor that comes with Sprout, which currently lets you do rudimentary beginning/end cuts, and add various effects and transitions. It's nothing out of the ordinary, but packaged with the Sprout, you might someday be able to customise your videos, pulling in images or footage from other sources.

Let's be honest: some of my coworkers who've tried the Sprout don't see the point. I can see where they're coming from, but I think it's because they don't see where the Sprout and its ideas are going. Traditional computing applications will be with us for a while, sure, but advances in imaging technology point to new kinds of computing on the horizon.

HP's recent hardware history has been unremarkable: decent machines, nothing too daring. But now we have the Sprout. It stretches the capabilities of a PC. Priced at £1,899, it may not sell like hotcakes (it's much too early to tell). But it's HP's bid to have at least one kind of computer that's ahead of the game, and that's a good place to be. ☒



Using **DREAMWORKS' STORY PRODUCER**, app you can create short features with canned backdrops, characters and motivations from the movie *How to Train Your Dragon 2*



GREY MARKET

Grey market sites offer great prices on cheap tech. **Marie Brewis** looks at whether they can be trusted

For a long time now we've been talking about Chinese smartphone makers producing high-end devices with mid-range or even budget prices, which rival the far more expensive brands we're familiar with in the UK, such as Samsung, Sony, HTC, LG and Motorola. But few of these are available to purchase through UK network operators or retailers, and if you want to get your hands on one of these handsets (or any other tech sold overseas), your options are limited to eBay, Amazon (sometimes) and the grey market.

We have recently begun reviewing some of these products, supplied to us by GeekBuying (geekbuying.com), Coolicool

(coolicool.com) and GearBest (gearbest.com), so we have first-hand knowledge of dealing with these sites. While our target audience here is largely UK consumers, the internet is a global resource and we have readers in all corners of the world.

In order to provide the best information possible in our best smartphone round-ups and the like, we want to ensure we are covering the best range of products. This includes names such as Xiaomi, Doogee, Gionee, UMI, Elephone, Ulephone, and so on, which you (and, indeed, we) have never come across before. They are, however, are gaining more market traction, both inside and outside the UK, than ever before. Not

only do these phones have great specs and low prices, they are typically dual-SIM too (see our feature on page 100), which is becoming increasingly popular in the UK. But until these brands officially release products to the UK market, the grey market is often your only option if you wish to buy them.

What is the grey market?

First, let's clear up an important issue: the grey market is not illegal. It is sometimes referred to as a parallel market, which is in fact a clearer representation of what it is. The grey market is a channel through which goods are imported by distributors not authorised by the manufacturer. It allows UK



TECH

consumers to purchase products that are not intended to be sold in the UK market, and at the lower prices typically paid overseas.

The grey market differs from the black- or underground market in that these goods are not illegal to buy in the UK. They are merely not intended to be sold here. However, while you are not breaking the law by buying grey market goods, there are some points you may like to consider, as we'll outline below.

UK shipping and Customs charges

While grey market sites offer free shipping to the UK, they do not pay any import duty charged by UK Customs when sending products from their depots. They ship

to a number of countries and each has different import rules.

"When you buy from GeekBuying, you are importing, and you are the importer who is responsible for the goods when the goods pass through Customs in your destination country," it states on Geekbuying's terms and conditions.

So, Customs charges are your problem. And if Customs gets in touch to say it has your package, then you won't receive it until you have paid up – in our experience you have 20 days to do so. If you fail to do so your package may be destroyed; if it is returned to sender you will find yourself responsible for the return costs.

Whether or not your parcel is picked up by Customs is very much a lucky dip, but legally the charges should be paid. Our best advice is to expect to pay import VAT, and include it in your calculation of the device's total price. You can read more about calculating Import VAT over on the gov.uk website ([tinyurl.com/mjhfsa7](https://www.gov.uk/guidance/import-vat)).

It's worth pointing out, however, that some grey market sites have EU- as well as Chinese warehouses. For example, Coolicool has warehouses in Germany, Spain and Italy. On buying products residing in these warehouses, it says you won't have to pay Customs charges. Grey market sites are usually willing to meet any

The screenshot shows the COOLICOO website with a navigation bar at the top. The main content area features several promotional banners for smartphones like the JIAYU S3, ELEPHONE P6000, and XON X3. On the right side, there are more product listings including the XIAOMI XIAOYI Sport Camera and ELEPHONE P3000S. A sidebar on the left lists various product categories. At the bottom, there's a 'Hot Deals' section with more smartphone offers. A text overlay at the bottom left of the screenshot states: 'You can purchase grey tech from websites such as COOLICOO'.

special packing or labelling instructions you may have. For those products sent by airmail, you may find your product marked up as of low value or a gift, although you should know that this will not make them exempt from UK Customs charges if they are found and opened.

Packaging

In our experience grey market products are incredibly well packaged, with monster bubble wrap. (Nobody in the office knows the correct name for this type of packaging, although there were some interesting suggestions, so we took a photo and you can see for yourself what it is.) The chances of your device being damaged during delivery is

very small which, given the postage charges, is in everybody's best interests.

Delivery times to the UK

Don't expect next-day delivery from these websites, although it is faster than you might expect. For example, Coolicool sent us an Elephone P5000 recently (read our review on page 42), and we received it five days later. This was sent via DHL, which is the fastest method of delivery, but products may also be shipped via regular- and registered airmail, which takes longer - perhaps as long as two weeks.

Also bear in mind that if your parcel is intercepted by Customs you should expect a longer delay.



Product pricing

When looking at a product on a grey market site look for a toggle at the top of the page to switch the currency to UK Sterling. Prices will otherwise be listed in US dollars. If there is no way to switch the currency, you can calculate the approximate UK cost by using Google Search's built-in currency converter. Just type into the search bar 'convert \$X to £' and hit Enter for an instant conversion.

You'll find prices are far cheaper than they are in the UK. Part of the reason for this is that products sold in the UK often have a significant markup in price. No doubt you'll have noticed that a product may go on sale in the US for \$300, and at the same time in the UK for £300, despite the fact right now there is around \$1.50 to the pound. We've heard the argument about US prices not including local taxes and VAT, but even so there is clearly some markup in the price. The grey market removes this, allowing UK consumers to buy goods at overseas prices.

Note that prices can go up and down on a daily basis. You'll drive yourself mad wondering what's the best price, so instead look at the current price and decide whether it's a price you're willing to pay for the goods on offer, then just buy the thing.

Will these products work in the UK?

Given that these products usually aren't intended to be sold in the UK, it's understandable that some may not work as expected over here. However, given the correct mains adaptor, the majority of tech products will work in any country - it's no different to taking your tech abroad when

you go on holiday. In our experience most grey market sites will also supply a three-pin adaptor if you let them know you need one.

One type of device with which it's particularly important to check the specs is smartphones. UK networks operate on different frequency bands to overseas operators, so it's crucial that you check which bands a phone supports and on which bands your network operates. If a phone claims to support the fastest 4G, it will be useless to you if your own network doesn't support the frequency, for example.

In the UK, the big four operate on the following frequencies: EE operates on 1800MHz 2G, 2100MHz 3G, and 800-, 1800- and 2600MHz 4G; Three operates on 900- and 1800MHz 2G, 2100MHz 3G, and 1800MHz and 2600MHz 4G; Vodafone operates on 900- and 1800MHz 2G, 900- and 2100MHz 3G, and 800- and 2600MHz 4G; O2 operates on 900- and 1800MHz 2G, 900- and 2100MHz 3G, and 800MHz 4G.

If you're buying a phone, tablet or other Android device, also keep in mind that it will most likely be rooted. That's not a particular concern for tech enthusiasts (some may even appreciate the fact they won't have to root it themselves), but newbies should note this rules out OTA OS updates.

On the subject of OS updates, there is no guarantee any updates will be offered. Whether software updates will be available for your device will very much depend on the device in question.

Another key consideration is not whether a product will work in the UK but whether it is allowed to work in the UK. It's your responsibility to check the legalities surrounding the shipping of a specific device to the UK - if it's legal to buy in China but illegal to ship to the UK, then that's your problem. The supplier takes no responsibility.

Are these products fake?

Coolicool claims its products are 100 percent authentic. However, would you know if they weren't? Probably not.

Returns policies

This is perhaps the biggest risk of buying from the grey market: what if your device is faulty? When buying products from overseas you are not covered by EU regulations. Bear in mind that when dealing with customer services the language barrier may become an issue, depending on the site in question.

Receiving faulty goods is something we've experienced, having received a faulty camera from GeekBuying. We've attempted to return the product three times and each time it has been redelivered to the office.

On the whole devices will not be faulty. As we've mentioned they are incredibly well packaged, and each product is checked



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Business tax – guidance

How to value your imports for customs duty and trade statistics

From: HM Revenue & Customs
 First published: 24 September 2012
 Last updated: 13 June 2013, see all updates
 Part of: Import and export procedures, VAT, Business tax, Import and export procedures and Trade and investment

Requirements of the import valuation system and the different methods for determining the value of goods produced outside the EU, for customs and VAT calculations.

Contents

- [Introduction](#)
- [Declaring an import value](#)
- [The main method of calculating import value](#)
- [Other methods of calculating import value](#)
- [Value for import VAT](#)
- [Import value for trade statistics purposes](#)
- [Where to find information on the valuation of imported goods](#)
- [Further information](#)

Introduction

This guide explains the requirements of the import valuation system. It outlines the different valuation methods for determining the value on which customs duty on goods produced outside the EU and import VAT are calculated. It also provides links to sources of further help and advice.

At importation from third countries you must declare the value of your goods to HM Revenue & Customs (HMRC) in the single administrative document (form C88). This value determines the amount of customs duty and import VAT payable and forms the basis of the trade statistics compiled.

Declaring an import value

Every time you import a consignment

The HM REVENUE AND CUSTOMS website will help you calculate whether you'll need to pay any import duties

before it is sent out to avoid the dramas surrounding returns. Even so, it's important that you check the returns policy of the site in question before you buy.

Using Geekbuying as an example, it offers a one-year warranty on all consumer electronics, meaning you can return the products for repair up to one year after its delivery date. If products have been misused, taken apart or water-damaged the warranty will be void, and it won't cover motherboard- or screen replacement. If a product is scratched or its appearance damaged Geekbuying will deduct 20 percent of the value when providing a refund, too.

Geekbuying pays the return costs for products that are dead-on-arrival, but you will be liable for some of the cost when returning items under warranty. Within the first month Geekbuying will pay the shipping costs, but you'll be refunded for them partly in Geekbuying coupons and partly in cash to your PayPal account.

Between one- and six months you will have to pay to return the item, but Geekbuying will ship you the repaired item for free. Between six- and 12 months, you pay the cost of returning the item and having it redelivered following the repair.



You may need a **THREE-PIN ADAPTOR** to charge your new device

If an item is faulty on arrival, you have two days to get in touch with customer service, providing them with photographic evidence. If the packaging is faulty, you will also need to file a complaint with the courier. If an item is of high value, you may be asked to send it back to Geekbuying before they are able to issue a refund or replacement.

If you've been sent the wrong item and can provide photographic evidence, Geekbuying will offer to refund you 10 percent of the item value because it's a cheaper solution than you returning the item and it shipping you the correct item. If you're not happy with this it will, of course, send you the correct item at its cost.

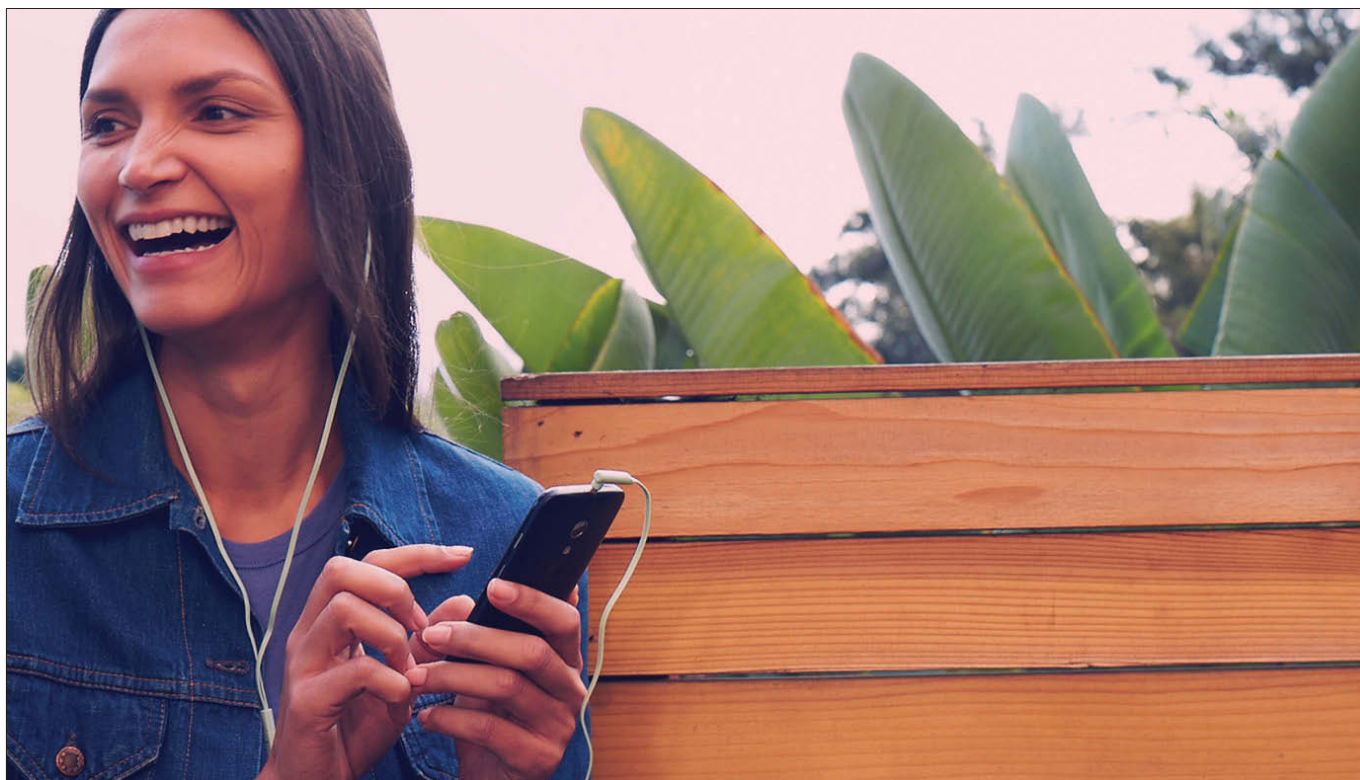
If you're returning an item simply because you don't like it (you have up to seven days to decide), you will be responsible for the round-trip shipping. That will be expensive, so make sure you really want a product before you click to buy it.

Verdict

Buying grey market tech is not for everyone, and it's clear there is some risk involved. You might get a great deal on a cheap phone, or you might get a headache that won't disappear for several weeks. Many people have great experiences in buying grey market tech (us included), but there are also some horror stories to be told. Now armed with the facts you can make an informed decision about whether buying grey market tech or cheap goods from China is an attractive solution for you. ☒

DUAL-SIM

BUYING ADVICE



Dual-SIM phones are incredibly popular outside the UK and we Brits want in. Marie Brewis reports

Dual-SIM smartphones allow you to use two SIMs in a single phone. Most people who use dual-SIM phones find the functionality useful for mixing work and pleasure, rather than carrying separate phones for their work- and personal contracts.

Dual-SIM phones are also useful for maintaining two personal contracts, whereby one might offer a good rate on calls and texts, while the other offers unlimited data. Or perhaps you frequently travel abroad, and would like to carry a UK SIM for when you're at home and another that is local to the country you're visiting.

Whatever your reason for requiring a dual-SIM phone, a problem in the UK is that most smartphones do not include the functionality as standard. Indeed, hardly

any of the phones we are sent for review are dual-SIM models, and even where dual-SIM versions are available they are rarely intended to go on sale in the UK.

Dual-SIM phones are incredibly popular outside the UK and in the developing world, but for some reason us Brits are being left out of the dual-SIM party. And we want in.

This is one reason why the grey market has become a popular solution for picking up a dual-SIM phone, but there are risks involved – read our advice on buying grey-market dual-SIM phones on page 100.

Another way you can find a dual-SIM phone is to search a site such as Amazon or eBay for 'dual-SIM phone', 'dual-SIM Samsung' or 'dual-SIM Sony' and so on. In doing so, you might find a dual-SIM version of the Samsung Galaxy S4 mini or Sony

Xperia Z3, for example. The Honor 6 is another phone that is available in dual-SIM format, just not officially so in the UK.

Having seen the standard single-SIM versions that are intended for UK sale, we have no doubt that these are great phones, but having not personally laid our hands on the dual-SIM variants we're reluctant to recommend them here. Plus, they tend to go off sale as soon as we add them to the round-up.

In this article, we recommend only phones that are sold in the UK with dual-SIM functionality as standard, and that we have personally reviewed. And in the future, we're hoping that the increased demand for dual-SIM phones means we will begin to see more and more dual-SIM smartphones supplied to us for review.



MOTOROLA MOTO G is available in dual-SIM format

How to manage calls, texts and data on a dual-SIM phone

Something we've noticed when shopping for dual-SIM phones is that the manufacturer very rarely provides any information about the functionality other than it exists. It doesn't tell you how dual-SIM works in practice, nor whether both SIMs support 3G, or even what size SIM cards they accept. As we've learned, you can never assume: you'll need to contact the manufacturer or check spec tables, reviews or forums to find out this information.

For that latter concern, as technology journalists who are always having to swap SIMs between the various phones we have in for review, we have found the best solution is to adopt a nano-SIM for our personal smartphone, then pair it with an adaptor when we need to use it in a phone that supports full-size- or micro-SIMs. SIM adaptors are very cheap, but some are better than others. We like the MediaDevil Simdevil, which comes with nano- to micro, nano- to mini and micro- to Mini adaptors, plus a SIM tray ejector tool. It costs £3.97 from Amazon. If you're planning to stick with the phone, however, you can always request a new SIM of the correct size for free from your network operator, then swap over your number.

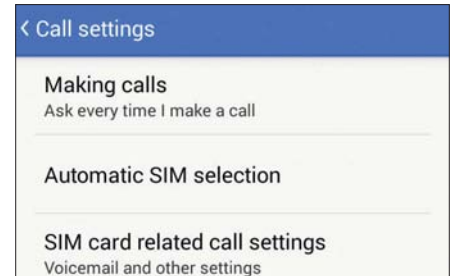
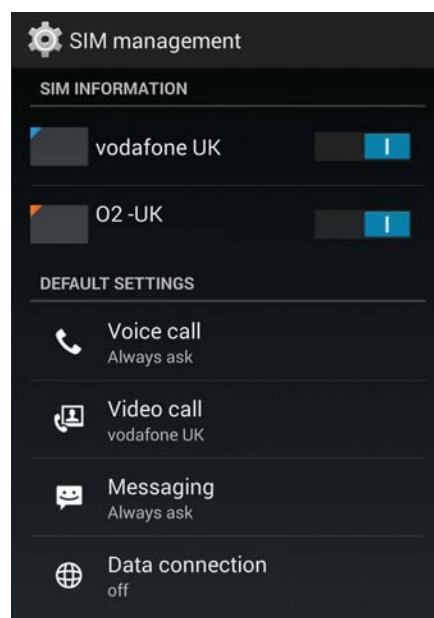
In all the dual-SIM phones we've tested both SIMs are on standby at all times (known as dual-standby phones), but you can actively use only one SIM at a time. This means that either SIM can accept a phone call or text

at any time, without you having to actively swap between them or reboot the phone. However, if you get a call on one number while a call is active on the other, it won't start ringing in your ear or give you the option to put the first caller on hold - the call will simply not be successful.

Dual-active SIM phones also exist, however, which use two modems and allow you to receive calls on both numbers at once. We've not tested any dual-active phones, but some more recent examples allegedly include the dual-SIM variants of the HTC One M8,

Sony Xperia Z3 and Samsung Galaxy S5 mini. (Always check before you buy, of course.)

If it's you who wants to make a call or send a text, Android has a standard SIM Management menu that lets you specify which SIM should be used for voice calls, video calls, messages and mobile data. You can either specify a particular SIM for each of these tasks, or leave the setting at Always



ask. If you choose the latter, the next time you want to make a call or send a text, you will be asked which SIM you want to use.

Motorola improves on this with its dual-SIM Moto G, with its Automatic SIM selection able to track your SIM usage and then suggest or automatically use a particular SIM for a certain mode of contact.

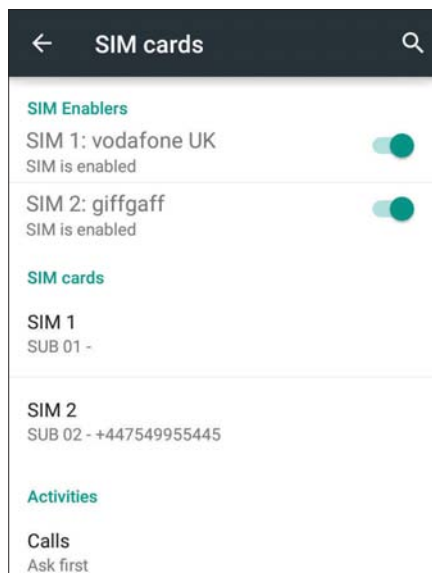
The data connection is where there seems to be a lot of confusion when it comes to dual-SIM phones. Whereas both SIM slots on some dual-SIM phones are capable of supporting 3G connections (for example, the Elephone P5000 reviewed on page), you can use 3G on only one SIM at a time. Unlike with



calls and texts the data connection can't be on standby for both SIMs: you must specify which SIM you want to use rather than select one when prompted.

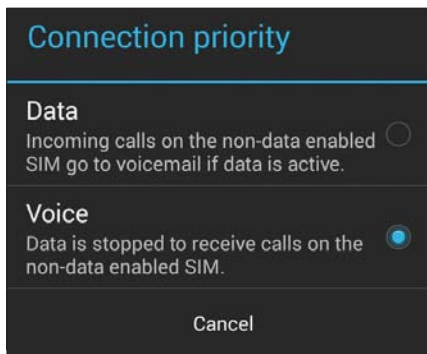
Of course, this isn't always the case, and the ZTE Blade S6 (read our review on page 46) supports 3G/4G only on its first SIM slot, and you can't change the data connection for browsing the web or making video calls. You can still specify which SIM should be used for calls and texts, although things look a bit different in Lollipop.

By default, when you are using the data connection on one SIM and a phone



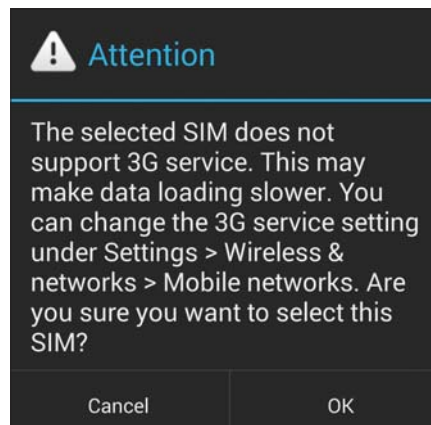
call comes in to the other it will pause the data connection on the first. In the Moto G, you'll find a Connection priority menu, which allows you to specify that calls should instead go to voicemail instead of interrupting your browsing. There is no such option on the other dual-SIM phones we've tested, but it's not something we'd be likely to change in any case.

The Elephone P5000 momentarily threw us when we attempted to switch the data connection from one SIM to the other. When we tried to change the data connection from O2 to Vodafone, it displayed a message suggesting that 3G wasn't supported by the Vodafone SIM. We knew it was, which suggested that the second SIM slot it resided



in was capable of 2G only. In fact, we found that if we first changed the Video call setting from O2 to Vodafone we could then change the data connection without issue. (Note that if your data connection is 'Off' this is because your Wi-Fi is switched on.)

Which SIM is configured to use the data connection is instantly evident from



the navigation bar, with the SIM in slot 1 displayed in blue and the SIM in slot 2 displayed in green. One will be marked with G and the other 3G.

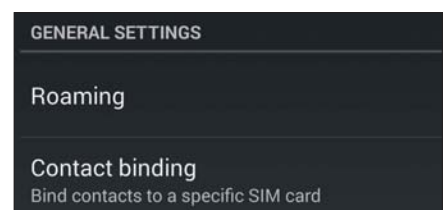
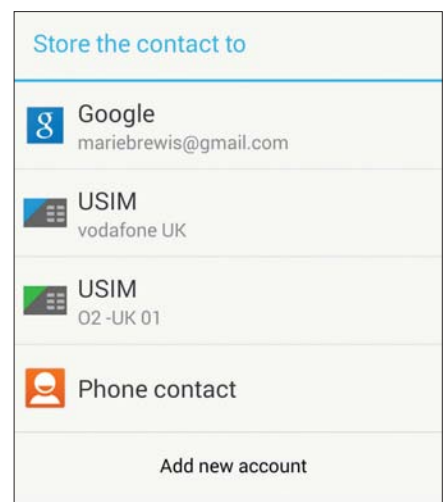
You can change these colours and whether or not the phone number is displayed within the SIM Management menu to make it more instantly obvious which is which. Both the Moto G and ZTE



Blade S6 also allow you to change the SIM card name.

Another issue when using dual-SIM phones is where your contacts are stored. We found that by default the contacts from both SIM cards are stored in the phone book. If you'd rather see the contacts from only one SIM, tap the three dots icon at the bottom right of the screen (within the Contacts app) and choose 'Contacts to display'. You can then select All contacts, Gmail contacts, phone contacts or one of your two SIMs.

Usually when you add a contact you get a pop-up menu asking whether you want to store the contact on your phone memory, your SIM or your Google account. Here you'll now see two SIMs in the list rather than one. A quick way to turn this off and prevent you always having to choose is to open the SIM management menu, select Contact binding and then select a specific SIM. ☒



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Reset your router to get rid of malware

Jim Martin reveals how to avoid fake websites and keep your login details safe

You've got to have your wits about you these days: scammers and hackers are everywhere. From the patently obvious email and Facebook scams to the invisible keyloggers and fake websites that steal your passwords and identities, it's almost as if you can't escape them. Even your router is hackable, and here we'll explain what to look for and how to fix a router infected with malware.

First of all, it's important to note that not many UK routers have been hacked. What typically happens is that cybercriminals use weak security to change your router's settings - usually the DNS (Domain Name Servers). This can be dangerous since your router could then redirect your web browser to fake versions of websites. Since they look the same as sites you already know, you type in your username and password and hand your login to the hackers.

This is why it's important to check in your browser that the site is the genuine article, especially if it's your bank or any other financial institution. Such websites have <https://> at the start of their address and your browser should also a padlock symbol. These aren't guarantees, which is why it's worth checking your router to make sure it's using the correct DNS.

Check your router's DNS servers

You will need to log in to your router's settings, which is accessed via a web browser. Every router is different, so you should check its menus for DNS servers. They are usually in the WAN, Broadband or Internet connection menu. In most cases, it should be set to 'Automatically obtain DNS server settings from ISP'. This means it will use the server addresses from your internet provider: BT, TalkTalk, Sky, Virgin or other supplier.

If it's set to 'Use the following' and numbers are present, check these using Google to find out whether they are within the ranges allocated by your ISP. If they don't match up, be suspicious. Note that you can't simply enter the numbers into Google, as it will

try to open it as a website. Instead, include the name of your ISP, for example: BT DNS 217.32.171.21.

Either enter the correct DNS servers (there are usually two addresses, a primary and a secondary, such as 62.6.40.178 and 62.6.40.162) or change the setting to obtain the addresses, save the changes and reboot your router. (It should tell you it needs to reboot, and either do it automatically or ask you to click OK.)

Rid your router of malware

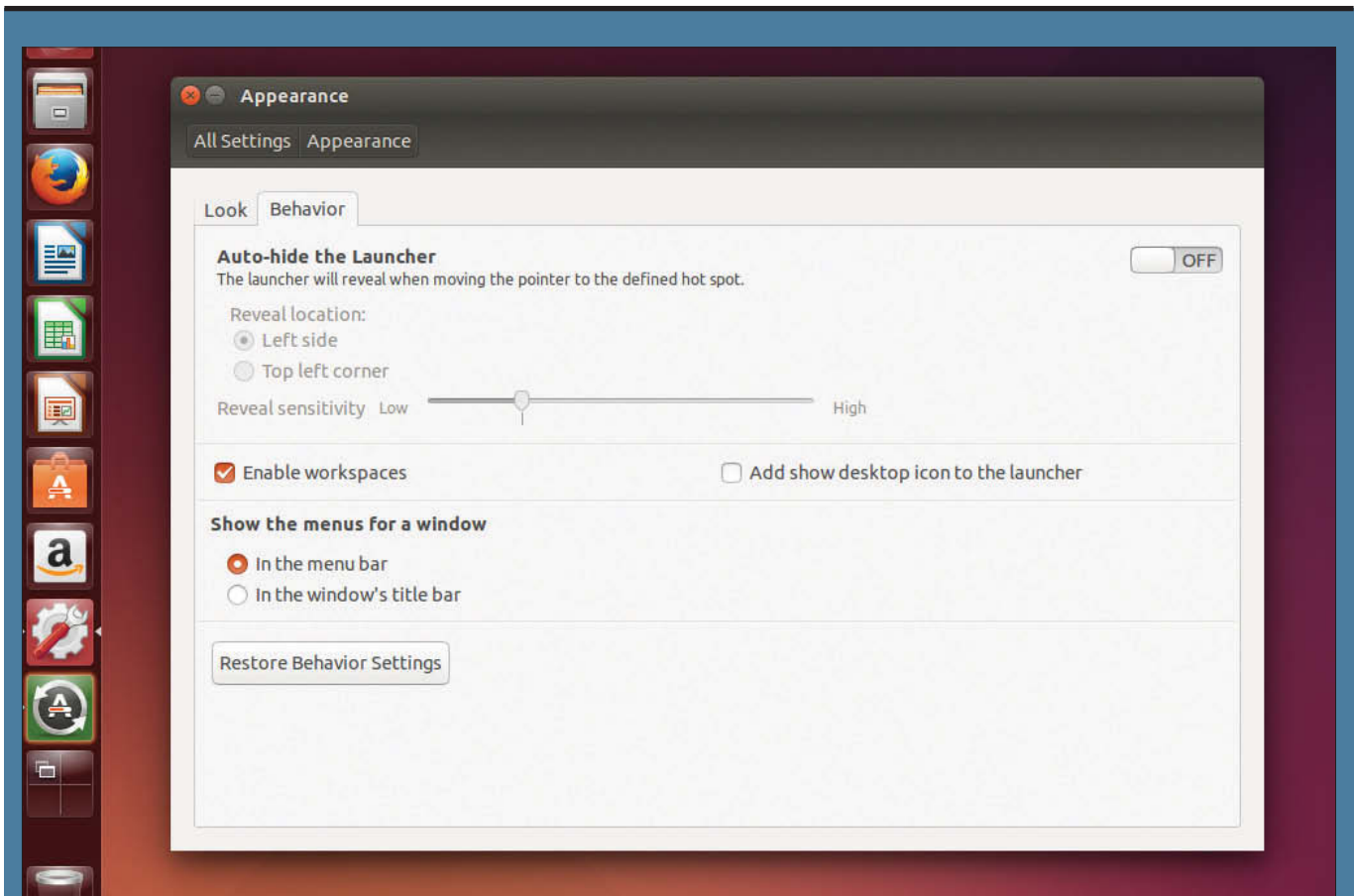
We've already explained how to check your router is using the correct DNS settings, but if after a reboot or unplugging from the mains for a minute, your router is still reporting spurious DNS servers, it could be infected with malware.

The only way to remove this is to install the latest firmware from your router manufacturer. As before, every router is different, so you'll have to look through its settings menus to find the option to upgrade the firmware.

And if your router is using the wrong DNS servers, it's best to download the latest firmware using a different router, which probably means doing it at work or a friend's house, unless you have an old router lying around.

Head to your router manufacturer's website, look for a Support section and then search for your particular router model. This is always printed on a sticker somewhere on the router. You'll have to download the firmware to your hard disk or a USB stick. Then, back in the router's menus, look for an Upgrade firmware option and direct the router to where your firmware file is saved. It might be possible to plug in a USB stick containing the firmware directly to the USB port on your router, but you'll still need a laptop or PC to start the update process.

If your router won't accept the file because of the malware, it might be necessary to replace the router with a new one. ☒



Bring back multiple workspaces in Linux

Many Linux environments are hiding workspaces by default. Chris Hoffman reveals how to bring them back

Windows users have long been jealous of workspaces – also called virtual desktops or multiple desktops – on Linux. But many Linux desktops have hidden this feature by default in recent years. Soon, Windows users will have multiple desktop workspaces enabled by default – and many Linux users won't.

That's a bizarre turnaround. Virtual desktops have long been one of the standout features of the Linux desktop and it shouldn't be lost. Thankfully, there is a solution. Here's how you can get started with workspaces on Ubuntu's Unity graphical shell, though it will work with other Linux environments.

Activate them

In Linux, you'll see a workspace switcher on the desktop's panels – it looks like a series or grid of rectangles. It's not enabled by default on many modern Linux desktops, presumably to avoid confusing new users, though that's an unfortunate omission.

To enable this feature on Ubuntu's Unity desktop, open the System Settings window and click the Appearance icon (see above). Select the Behavior tab and check the 'Enable workspaces' checkbox. The Workspace Switcher icon will appear on Unity's dock.

If you are using another Linux desktop, right-click its panels and look for this option. On the Cinnamon desktop, offered in Linux Mint, right-click the panel, select 'Add applets to the panel' and add the Workspace switcher from the list. On GNOME Shell, you can open the Activities overview and manage workspaces from there; while the KDE desktop, right-click the panel, point to Panel Options, select Add Widget, and add the Pager widget.

Using workspaces

Clicking the Workspace Switcher on Ubuntu's Unity and many other modern desktops will give you an overview of your workspaces and the applications open on each. On more traditional desktops without flashy effects, the workspace switcher may only let you click between desktops.

Click a workspace to switch to it, or drag-and-drop windows between them. On Unity, it's all pretty simple and you don't need to master mouse actions or keyboard shortcuts.

Activating workspaces on Unity will add some additional options to each window title bar's context menu. Right-click a window's title bar and you'll find options for moving that window between different workspaces or making it appear on all workspaces. Similar features are available here on most Linux desktops.

Keyboard shortcuts are available, too. On Unity, hold down Ctrl + Alt and tap an arrow key to quickly move up, down, left, or right between workspaces, depending on how they're laid out. Add the Shift key – so, press Shift + Ctrl + Alt and tap an arrow key – and you'll switch between workspaces, taking the currently active window with you to the new workspace.

On some desktops, you may also be able to grab a window's title bar and drag it to the edge of the screen. The screen will flip over to the adjacent workspace, and you can drop the window there.

So, what can you do with workspaces? Anything you want. Let's say you work on your computer, as many of us do. You could, for example, have one workspace dedicated to work with all your work applications. It's a way to organise open windows into groups. ☑



Get rid of TouchWiz on Samsung Galaxy

Make any Samsung phone work like a Nexus by removing the TouchWiz interface. Matt Egan reports

One of the great things about Android is that it is customisable. Unlike Apple's iOS and Microsoft's Windows Phone 8, Google's OS is open to developers, so that each manufacturer can put their own spin on the software. The trouble is, they do. And for everyone who loves HTC Sense or Samsung TouchWiz, there is another who wants only a clean, Google-like Android smartphone. If you find that your Samsung phone is a little too pushy with its notifications, it may be that it is TouchWiz to blame.

TouchWiz is Samsung's own skin for Android. To some people, it adds a welcome splash of colour and many useful new features. But if you want to make your Samsung phone more Google than Samsung, we can show you how.

The methods outlined here range from easy to difficult, so you should try them in the order they have been written. But you get nothing for nothing, and to truly dispense with TouchWiz you may

be forced to go for method three: rooting your phone and adding a custom ROM. My own preference is to use the Google Now launcher as outlined in method two.

Reset your phone, and disable individual features

This will not remove TouchWiz, but depending on what it is about Samsung's software that irks you, it may remove the problem. If you really want rid of TouchWiz, move on to the next section.

First you need to factory reset your Samsung phone. Go to the Apps page, and then head to 'Backup and reset', under 'User and backup'. Scroll down to 'Personal Data', and choose 'Factory data reset'. All data will be erased from device memory, so make sure that you have backed up all the files and documents you need. You will be able to reinstall contacts, emails and apps by resyncing with your Google account.

Once you have hit 'Erase everything', your Samsung phone will reboot and reset. To avoid the worst of TouchWiz's excesses, you need to discipline yourself not to accept software updates, and not to sign up for a Samsung account. You may find that the behaviour of TouchWiz that previously bothered you is now absent.

One of the things that we know bothers TouchWiz users is the constant updates from Samsung's S Planner calendar app. To get rid of it, first trash the icon from your phone's homescreen, and disable the widget from that list. Next, go into Settings, Applications, Application Manager and find the S Planner app. Force stop it, disable it, clear the data and the cache.

You will now be free of TouchWiz calendar alerts, and that may be enough to make TouchWiz bearable for you. If not, read on.

Install the Google Now Launcher

This is the most you can do without Rooting your phone, and in our experience it hits the spot. But if you really want to get rid of TouchWiz, scroll down to the next section.

A custom Launcher allows you to customise your homescreen – and in this case, to get rid of the worst excesses of Samsung's TouchWiz overlay. Put simply, a Launcher is an app that lets you change how your Android homescreen looks and works.

First, go to the Google Play Store and install the launcher you most like the look of. Some of the best custom launchers for Android include Action Launcher, Apex Launcher, Aviate, and Nova Launcher. There are paid-for and free launchers.

The free Google Now Launcher is available on all devices with Android 4.1 (Jelly Bean) or later. Although it's limited - it is a means of making Google Now central to your usage of your device - if you like to Ok Google and dislike the added faff that is TouchWiz, this could be the launcher for you. And as it is free and guaranteed not to mess with your Android, why not give it a whirl?

Root phone, and flash the Google Play Edition ROM

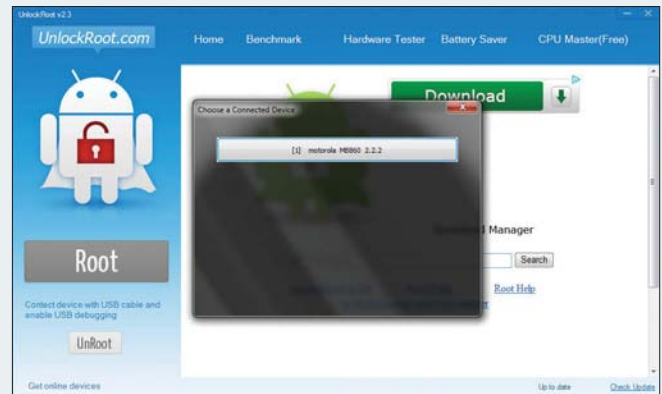
Okay, this is it. The surefire way of losing TouchWiz. This requires rooting your phone, and installing a new ROM (in common parlance, getting rid of Samsung's version of Android, and installing another). All the usual disclaimers apply: once you have done this, you won't be able to go back, although you will be able to install one of the many ROMs available for Android devices. It may also affect your smartphone's warranty. But done correctly, this could turn your bloated TouchWiz Samsung into a Google Nexus device.

First, you need to root your Samsung phone. (You will need a Windows PC connected to the web, and a USB cable.) Rooting your phone might seem like a scary thing to do but it's actually quite simple and straightforward. There are a number of downloadable tools which will perform the root to choose from. Not all tools will support all Android devices so check if your device is supported. Some popular ones include SuperOneClick (shortfuse.org), Unlock Root (unlockroot.com) and Z4Root (tinyurl.com/28ugspx).

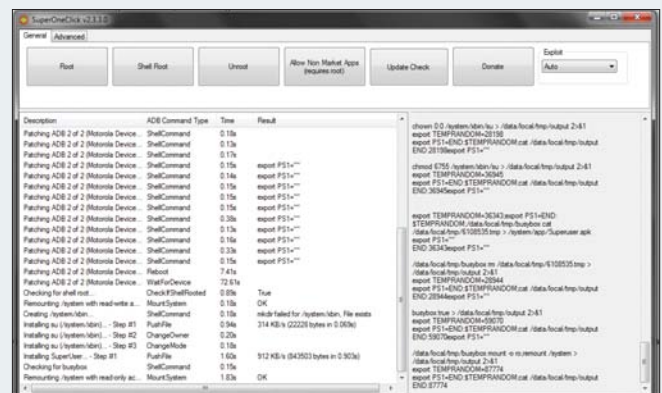
Rooting does vary from device to device, so check out XDA (xda-developers.com) for help and advice and Android Central's (tinyurl.com/Lcynpdn) large list of devices. It's best to do a bit of research on your model before proceeding - check whether it's easy to reverse the process or not. If you're happy with the risks and the process, then here's how to root your Android device.

First back up your device. Just in case something does go wrong, it's best to back up to avoid losing important data such as contacts and media files. Now find, download and install your chosen rooting software. We used SuperOneClick. Install the driver/software for the handset on your PC. Depending on the make and model this can sometimes be done by plugging the phone in via a USB cable or a download from the internet. Next, enable USB debugging on your device. This can be done in the Development

section of the Applications settings menu. Connect the Samsung phone to your PC with a USB cable.



Run your chosen rooting software and in most cases press the Root button. The software might ask you to select the device you wish to root. Do so and click Continue. The software will perform the rooting process which may involve several reboots of your device. If the rooting was successful, you should receive a notification on your PC. You now have root access to your handset's system.



Now you have a rooted phone, we want to install our Google-esque ROM. This is a two-step process.

First, you'll need to download the TWRP file (tinyurl.com/n32ykyne) to your PC. Put your Samsung phone into Download Mode, by holding in the Power, Home, and Volume Down buttons at the same time. Then push the Volume Up button once you get a warning screen. Plug your phone back into the PC's USB port. Go back to the software you used to root the phone, and browse for the custom TWRP file ([openrecovery-twrp-2.5.0.2-jfltexx.tar](#)). Click and the software will install TWRP on your Samsung phone.

On the PC, find your phone under My Computer, and double click it. In the phone, via your PC, create a folder called 'ROMS'. Download the Google Play Edition .zip file (tinyurl.com/o87jgka). Drag and drop the downloaded 4.3 Google Play Edition .zip into the ROMS folder you just created on your phone, and then disconnect the device from your PC. Switch off your phone. Next, boot it into Recovery Mode by holding in the Power, Volume Up, and Home buttons until 'Recovery Booting' appears in the top left corner. Release the power button but keep holding the Volume Up and the Home button until 'TeamWin' appears on the screen. Click on Wipe, Advanced Wipe. Select 'Dalvik Cache', 'System', and 'Cache'. Move the slider to complete the wipe.

Now take one step back, and click on Install. Scroll down to the ROMS folder you made on your phone. Click on the Google Play Edition .zip file, then slide to install the ROM. Once the install process is completed, you will have a Google Play Edition Samsung phone. ☒

The screenshot shows the Amazon Prime website interface. At the top, it says "amazon Prime instant video" and "Enjoy unlimited instant streaming of movies and TV shows. Anywhere, anytime." Below this, there are two main buttons: "Start your 30-day free trial" and "Existing LOVEFILM Member? Switch your account now". To the right, there's a grid of movie and TV show posters including "BOSCH", "LIFE OF PI", "DIVERGENT", "PITCH PERFECT", "BLACK SAILS", "TRANSPARENT", "WALKING DEAD", "THE FALL", "SCANDAL", "SHIELD", "LOVEPUNCH", "HORRIBLE BOSSES", "RECEPTION", "WARD MOMENT", "NEED FOR SPEED", "DARK SHADOWS", "THE SESSIONS", "DIVERGENT", "CLOUD ATLAS", "NEW GROOM", "THE FALL", "SCANDAL", "SHIELD", "LOVEPUNCH", "HORRIBLE BOSSES", "RECEPTION", "WARD MOMENT". Below the grid, there are sections for "TV on Prime", "Top 100 Prime Movies", "Top 100 Prime TV Shows", and "New and exclusive to Prime". At the bottom, there are two rows of "Watch Recently Added Prime Movies" and "Watch Recently Added Prime TV".

Get Amazon Prime for just £16 per year

Ashleigh Allsopp reveals how you and your friends can get Amazon Prime for £16 per annum

Amazon Prime is the name that Amazon has given to its £79 per year service, which includes free one-day delivery and the Amazon Prime Instant Video TV and film streaming service that rivals Netflix. Amazon allows you to share that membership with up to four family members, meaning you can share out the cost to make it just £16 per year. Note: you can only share the Amazon Prime delivery benefits, so Prime Instant Video and Kindle Owners' Lending Library is not included.

The first thing you'll need to do is sign up for Amazon Prime, by logging in to Amazon, clicking Your Account and then clicking Amazon Prime. Follow the on-screen instructions to sign up. You'll have to pay the £79 right away as the main account holder, but you'll get the money back from your family members.

Now that you've signed up, you'll need to go to Manage Prime Membership. Scroll down to Invite a Household Member. You may

have to expand the section to see the form that allows you to invite new members. You'll be asked to type in your family member's name, their relationship to you (you get the option of Brother, Sister, Spouse, Parent or Unmarried partner), their email address and their birthday. Then, simply press send invite. They should receive the invite in their email inbox almost immediately. In order to confirm the invitation, they'll need to enter your birthday to confirm that they know you. Once they've accepted, you'll see their name in the Accepted Invitations section.

You can revoke their invitation at any time (perhaps if they don't pay you the £16) to stop sharing your Prime membership with them. To do so, click the circle next to their name in the Accepted Invitations list and then click the Revoke button.

If you've got an Amazon Prime student account, you won't be able to share your delivery benefits with others.

Technically, you should only share your membership with other family members living in the same household, but it actually works with those who don't live at your address. So, as long as the person you're inviting knows your date of birth (and you know theirs in order to send them the invite in the first place) it'll work. You would be telling porkies about your relationship with them if you're inviting a friend, though.

In fact, if you don't know enough people who want to split the cost of the Amazon Prime membership with you to make it just £16, there are people over at HotUKdeals willing to chip in. ☒

The screenshot shows the Amazon Prime Settings page. It has three main sections: "Settings" (Password, Prime & E-mail), "Account Settings" (Change Name, E-mail Address, or Password; Forgot Your Password?; View or Change Your 1-Click Settings; Manage Prime Membership; Amazon Student Membership; Amazon Family Membership; Manage VAT Registration Number; Manage Text Tracking Alerts (UK +44 numbers); Manage Login with Amazon; LOVEFILM By Post Membership), and "Address Book" (Manage Address Book; Add New Address). There is also a "Notifications from Amazon" section (Notification Settings; Amazon Local and Amazon Delivers E-mail Subscriptions; Product Availability Alerts).



Install a smart doorbell and security system

Fed up with cold callers on your doorstep? Matt Egan shows how to set up a video-entry system for the home

So, 2015 is the year of the smart home: we all control our heating via our smartphones, record and watch TV remotely on the same device, and play music via our smart light bulbs. We do, don't we? Well, we can. And the application of smartphone-controlled smart home technology is only going to become more prevalent.

But 2015 is also an election year: and that means a spate of well-meaning local politics types traipsing to your door to convince you to back their candidate. And if your street is anything like mine, we are just about to enter 'gutter season', in which a succession of local tradesmen knock on my door inviting me to pay them to clear my gutters (not a euphemism).

Benefits of a smart security camera system

Reader, call me a misanthrope, but I don't like people calling unannounced at my door. More than that, just as the biggest security threat to your PC is likely to be your behaviour, the greatest opportunity for thieves and con men is to catch you unawares at your front door. This is doubly true for vulnerable or elderly people. The world is actually a pretty safe place, but if someone wants to get into your home, the easiest way to do so is to persuade you to open up the front door.

In the past video-enabled entrance systems required a lot of money and expertise to install, and maintain. They were the preserve of swanky apartment complexes or spit-drenched local authority housing tower blocks, often in a state of disrepair. But now everyone with a smartphone can have a smart security camera and entrance system. Arguably they should. And if you are

concerned about a relative or friend, you can set them up with one, and also see yourself who is at the door when they go to answer it.

One reasonably inexpensive smartphone-connected doorbell and video entry system is the DoorBird, which will be available soon in the UK. You can pre-order this system now: it costs €299 (£215) for the DoorBird Video Doorbell itself, and €289 (£208) for the BirdGuard Add-on Camera. Simply head over to doorbird.com and order your system. If you have a home Wi-Fi network and at least one smartphone, set up is simple.

For this price, you get an easy to install, Wi-Fi connected front doorbell and a Wi-Fi connected security camera that is designed to live outdoors. It also has a 180-degree field of view. To this you can pair up to eight iPhones, iPads or Android smartphones and tablets, and then answer the door from the safety of your phone screen. Whenever you are connected to the web you can listen to- and talk to visitors to your home, as the DoorBird works over 3G and 4G too. If like me you are paranoid about your home when you are on holiday, this is a handy feature to have.

The video is HD too, according to DoorBird, so you will be able to see the full horror of Halloween trick-or-treaters in glorious technicolour. For fans of *Silence of the Lambs*, the DoorBird comes with night vision - you could always set up an outdoor light, too.

The security features look great, in fact. You can speak to people at your door, even if you aren't there. And when they ring the bell DoorBird takes a snapshot of them. If you have a bad experience with a courier or salesperson, they won't be able to wriggle out of it by saying it wasn't them. ☒

facebook®



Link Android contacts with Facebook

Ashleigh Allsopp shows how to manually link your smartphone's contacts with your friends' Facebook profiles

Linking your contacts with Facebook can be handy, but it can be frustrating, too. Often, you'll find that some didn't sync automatically, that you now have duplicate contacts because the names don't quite match, or that your contacts book is overflowing with the details of Facebook friends you didn't know you had. Thankfully, there is a way to manually link or unlink contacts with Facebook on Android, and here we show you how.

How to sync contacts with Facebook

If in your contacts book you can't see any linked Facebook contacts, you'll first need to go to the phone app, tap contacts, and then tap more. Next, click accounts, and if you've got the Facebook app installed on your smartphone and are logged in, you should see Facebook there as an option. Tap it, and then check whether you've turned Sync Contacts on. If not, you'll want to turn it on now. It'll take a moment to sync.

Now go back to your contacts book and you'll find lots of new contacts, all of which have been imported from Facebook. Not all of them will have phone numbers but many will have email addresses at least, and they should also have profile images. Finally, tap Merge duplicate contacts in the Phone app's Settings menu to clean your contacts book up a bit.

Still not working? If you just want to delete some of the contacts that are showing up, go through your contacts book and tap and hold on a contact you don't want to see, then tap delete.

How to manually link contacts with Facebook

Annoyingly, though, manually merging and linking your contacts with their Facebook profiles has been difficult since Android 4.0. It's not ideal, but the best solution we've found comes from a third-

party app. There are several options, but the best one we've found so far that's free and works well is Sync.Me (tinyurl.com/qjnm4yn).

This lets you match Facebook contacts with contacts already stored on your smartphone. It's less picky than the built-in Facebook sync tool, and lets you manually choose which contacts match with which Facebook profile.

If you find that a contact is matched with the incorrect profile, tap on it within the Sync.Me app, tap Wrong Profile and browse Facebook to find the one that matches. Any contacts that Sync.Me isn't sure about will show on the Solve Matches page. Simply tap the contact's name, and then tap the profile in the 'Suggestions' section that matches, or click Facebook to manually browse your contacts to find the right person. When you've finished, tap Done and the app will sync all of your contacts.

You might find that some contacts still haven't synced, particularly if you've listed that contact in your phone book with a nickname, or perhaps simply Mum or Dad, for example. To fix that, go into the Sync.Me app, tap on the relevant contact, and then tap the plus icon beneath Facebook. You can now find that person's profile and manually sync it.

How to delete all Facebook contacts

If you've already synced from Facebook using the method described earlier, you may find that hundreds of Facebook contacts you don't want on your phone will still be showing up. To delete them all at once without getting rid of the Sync.Me contacts and the contacts you've imported from other accounts, go to Contacts, tap Menu, then tap Accounts. Tap on Facebook and then on Remove account. If you change your mind, you can go back to this page, tap Add account and then choose Facebook. ☒



Reconnect to WhatsApp Messenger

If you're having trouble connecting to WhatsApp, Marie Brewis reveals the steps you need to take

We've had several readers contact us to say they can't connect to WhatsApp. For many, the problem was with the service itself, and has now been rectified. However, if WhatsApp is not down, and you fear the fault lies with your own phone, here are some fixes.

If you can't connect to WhatsApp, this is usually because you don't have an active web connection. Check whether you can use any other online services or browse any web pages on your phone.

If you can't get online at all there are several things you can try. If you're using Wi-Fi, first try toggling the connection on and off, or putting into and then removing the phone from Flight mode. Alternatively, you can try restarting your phone.

Also make sure your phone isn't dropping the Wi-Fi connection when it goes to sleep (go to Settings, Wi-Fi, choose Advanced from the Options menu, then ensure 'Keep Wi-Fi on during sleep' is set to Always). If you're sure that the broadband service itself is not down, try restarting your wireless router. If you're using mobile data, then check your mobile data connection is not turned off in the Settings menu, and that you have sufficient signal.

You should also check you haven't restricted background data usage for WhatsApp in the Data Usage menu, and that your APN settings are correctly configured. If you can use WhatsApp over Wi-Fi but not your mobile connection, it's likely that the APN settings are not configured to allow non-web traffic.

If you're happy that you have an active internet connection, the next step is to ensure you've downloaded the latest updates for WhatsApp. On an Android phone you should check for app updates by opening Google Play, tapping the three lines at the top left and choosing My apps, then checking the Installed tab for available updates. On an iPhone, open the App Store and tap the Updates icon at the bottom right of the screen.

If WhatsApp still isn't working, try uninstalling and reinstalling WhatsApp. You will lose any conversations you have, but you can back these up by opening the Settings menu within WhatsApp and choosing Preferences, Backup conversations.

On an iPhone WhatsApp suggests that you also make sure you are running the latest version of iOS. ☒



Add Qi wireless charging to a smartphone

Lewis Painter explains how to power your handset with a Qi wireless charger

The term 'wireless charging' is one that's thrown around a lot by manufacturers and publications alike, but it can mean different things to different people. When many refer to wireless charging, they're actually referring to inductive charging - similar to the technology that the Apple Watch uses. Qi is a standard developed by the Wireless Power Consortium for inductive electrical power transfer over distances of up to 4cm.

Compatible devices

There are a growing number of handsets that come with the Qi charging feature. They include: Samsung's Galaxy S5, S6, S6 Edge and Note 4; the Google Nexus 4 to 7; the Motorola Droid Maxx; and the Nokia Lumia 920, 928, 929, 930, 1020 and 1520.

Some smartphone manufacturers also offer their own charging pads. Samsung, for example sells one for £30 (pictured above). Not only does it match the design aesthetic of the Galaxy S5, but it also automatically shuts itself off once your phone has fully charged.

Add Qi charging to an unsupported phone

It's all well and good using a Qi charging pad if you own a compatible device, but what about those of us that don't? Apple is a good example of a brand with a high number of users who can't take advantage of Qi charging. There is, however, a solution.

If you own an iPhone 5, 5s, 5c, 6 or 6 Plus, there's the £20 iQi Mobile (pictured right). It's slimline design fits between your handset and its case. You'll need to ensure that its Lightning cable is permanently plugged into your iPhone for it to work, though.

For Android users Xcsource offers a similar alternative, but instead of having to slot the Qi charging receiver between your phone and a case, you stick it on the back with the film

provided and plug the Micro-USB into your handset. It's ultra-thin and shouldn't add any extra weight. Xcsource says it will work with almost every smartphone with a Micro-USB slot, and at £6.49 it's a lot cheaper than the iPhone alternative, too.

If you can take the back cover off your handset there's a neater alternative. Using the same Qi charging receiver film as above, simply plug the Micro-USB cable into the charger, stick the film to the inside of the cover and then reattach the cover to the phone. If you've done it correctly, the phone should start to charge when placed on a Qi charger, such as the Tylt VÜ stand. ☒



LETITIA
AUSTINONLINE
REGISTRATION
REQUIRED

Stegano OkayFreedom: Premium Flat

FULL PROGRAM (12-MONTH LICENCE) AVAILABLE ONLY ON THE DISC+

Installation details

Go to My Computer, right-click the DVD icon and open the disc. Select Files 239\Stegano OkayFreedom and open the install file.

Online registration required:

Follow the instructions within the program by 16 June 2015.

System requirements

Windows XP/Vista/7/8;
1GHz processor; 1GB
RAM; 50MB drive space;
internet connection

Stegano OkayFreedom is a VPN service that allows private, uncensored web surfing.

Features

- Access blocked websites
- Use all of your favourite websites when abroad
- Access the web securely – even in public hotspots
- Surf the internet anonymously
- Protect your privacy online
- Surf with servers in 12 countries

How it works

Upset when you can't view a video online? With OkayFreedom's VPN service this problem will be history. It recognises whether content, videos and entire websites are restricted in your country, and automatically directs you over a server that enables you to view the content. OkayFreedom is also the right choice when you want to stop someone from following your surfing history.



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ONLINE
REGISTRATION
REQUIRED

1-abc.net Synchronizer 7

FULL PROGRAM AVAILABLE ONLY ON THE DISC+

Installation details

Go to My Computer. Right-click the disc icon and open the disc. Select 239\1-abc.net Synchronizer 7 and open the install file.

Online registration

required: Go to tinyurl.com/ybcjv87. Follow the instructions within the program by 16 June 2015.

System requirements

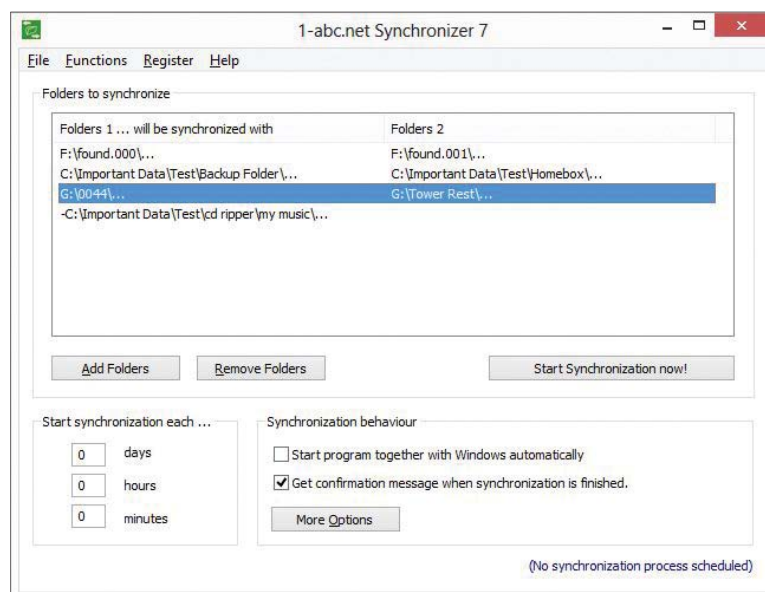
Windows XP/Vista/7

Saving data to internal- or external hard drives, USB sticks, SD cards and other rewritable media has one big disadvantage: no-one uses the same path. This means that you may find that a folder you created for security backups was used to change files, while the content of an original source folder was not modified. Others copy documents to a USB stick, make changes to the file and then forget to overwrite it later on their local computer. Or they save a file on a network drive to allow other users to make changes, but don't remind themselves to update the file for their own local use before they edit the data again.

That's where 1-abc.net Synchronizer comes in. This handy application is able to compare folders, detecting new files, as well as modified ones, and always saves the latest versions to both folders. Now you won't have to worry about having the current data anymore. You can start a synchronization manually or configure the program so that it does this job for you.

Features

- Easy-to-use interface
- Synchronize as many local or external folders as you wish
- Program can also read from and write to SD cards, USB sticks and external drives
- Schedule your synchronization in days, hours and minutes
- Write synchronization history to log file
- See what files would be copied without 'real' copying
- Load and save synchronization projects
- Decide if folders have same priority or determine a master folder



Ashampoo GetBack Photo

FULL PROGRAM AVAILABLE ONLY ON THE DISC+

ONLINE
REGISTRATION
REQUIRED

Installation details

Go to My Computer, right-click the DVD icon, and open the disc. Select Files 239\Ashampoo GetBack Photo and open the install file..

Online registration required: Follow the instructions within the program by 16 June 2015.

System requirements

Windows 98/2000/XP/
Vista/7/8; 256GB RAM
(2GB for Blu-ray);
17MB drive space

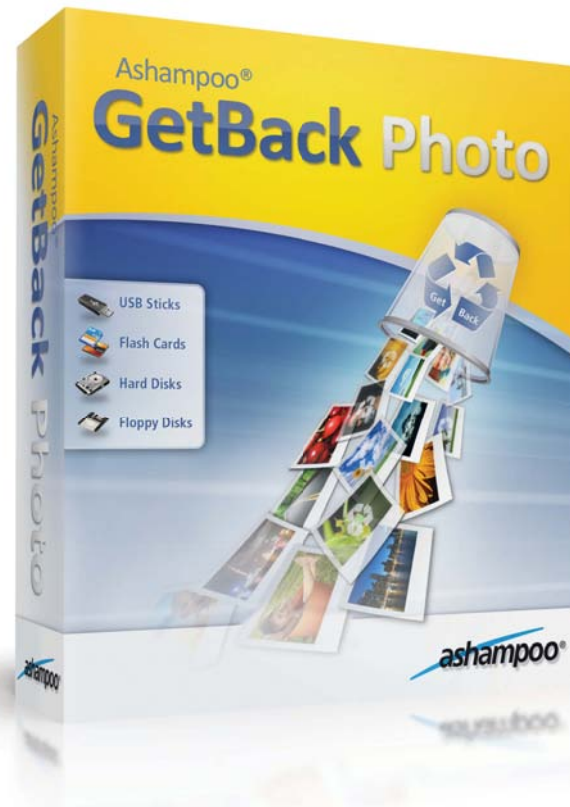
Photos have a priceless, sentimental value, so it can be upsetting when you realise that you've lost digital photos of, for example, your wedding, and that you don't have a backup.

With Ashampoo GetBack Photo, the loss of these pictures doesn't have to be permanent. The program enables the quick recovery of photos from different storage devices in just a few steps.

In contrast to many conventional undelete programs, GetBack Photo recovers not only photos that were deleted 'normally', but also images from storage devices that have already been formatted.

Features

- Recovery of deleted or damaged image files
- Scan of all storage devices in the system
- Photos might even be found, after the storage device was formatted
- Metadata is also recovered, such as EXIF and IPTC
- Support of all common file formats, including JPEG, PNG, BMP, GIF and RAW
- Photos are also found in file formats such as PDF and Word documents
- Display of recoverable photos as thumbnails



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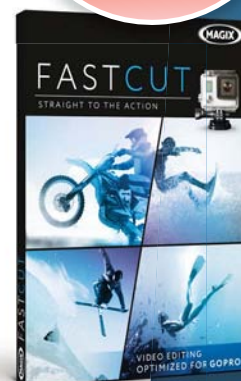
Fastcut makes importing data fast and easy. You can edit videos on your camera or import them via SD card or USB cable. Thanks to the proxy editing feature, you can quickly and smoothly edit 4K and HD recordings saved on your memory card.

Fastcut allows you to manually edit your videos or have them automatically composed for you. For automatic editing, Fastcut offers a wide range of thematic templates with fitting songs, cuts and transitions. This way you can quickly and automatically piece together all your recordings to fit the beat of the music. Additional effects such as vintage look, tracking shots and slow-motion effects can also be added individually.

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119



120



121



122



123



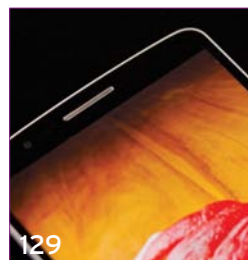
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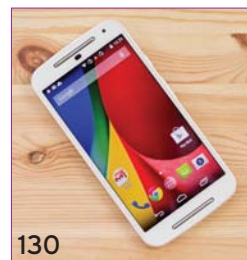
127



128



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145

Prices listed are those quoted by the distributor or manufacturer and include VAT. They are intended only as a guide.

If you're interested in purchasing one of the products reviewed here then please contact the manufacturer or supplier directly, mentioning both *PC Advisor* and the issue in which you saw the product. If it won't supply the product as reviewed, contact us at jim_martin@idg.co.uk.

Manufacturers are under no obligation to feature reviewed products on their websites. Our recommendations are for guidance only.



Star ratings and Gold, Recommended and Best Buy badges are awarded at the time of the original review and given in relation to the market competition at that time.

Best laptops	    				
	1	2	3	4	5
	Aorus X7 v2	Aorus X3 Plus	MSI GE70 2PE Apache Pro	Schenker XMG P304	Dell XPS 15
Price	£1,720 inc VAT	£1,530 inc VAT	£1,100 inc VAT	£1,100 inc VAT	£1,449 inc VAT
Website	Aorus.com	Aorus.com	UK.msi.com	Mysn.co.uk	Dell.co.uk
Launch date	Sep 14	Nov 14	Sep 14	Jul 14	Sep 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.4GHz Intel Core i7-4860HQ	2.4GHz Intel Core i7-4860HQ	2.5GHz Intel Core i7-4710HQ	2.2GHz Intel Core i7-4702MQ	2.3GHz Intel Core i7-4712HQ
RAM	16GB DDR3	16GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3
Storage	1TB HDD, 3x 128GB SSD	2x 128GB SSD	1TB HDD, 2x 128GB SSD	250GB SSD	512GB SSD
Screen size	17.3in matt	14in matt	17.3in matt	13.3in matt	15.6in gloss
Screen resolution	1920x1080	3200x1800	1920x1080	1920x1080	3200x1800
Graphics	2x nVidia GeForce GTX 860M	nVidia GeForce GTX 870M	nVidia GeForce GTX 860M	nVidia GeForce GTX 860M	nVidia GeForce GT 750M
Video memory	8GB	6GB	2GB	2GB	2GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n/ac	802.11b/g/n/ac	802.11b/g/n/ac
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	*
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x USB 2.0	2x USB 3.0, 2x USB 2.0	3x USB 3.0, 1x USB 2.0	3x USB 3.0, 1x USB 2.0
FireWire	*	*	*	*	*
Thunderbolt	*	*	*	*	*
DisplayPort	✓	✓	*	*	✓
HDMI	✓	✓	✓	✓	✓
DVI	*	*	*	*	*
VGA	✓	*	✓	*	✓
eSATA	*	*	*	✓	*
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	None	N/A
Extras	HD webcam	HD webcam	HD webcam	720p webcam	720p webcam
Operating system	Windows 8.1 64-bit	Windows 8.1 64bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Bundled software	None	None	None	None	None
Gaming scores	189/157fps in Tomb Raider	60.9/38.3fps in Tomb Raider	120fps in Batman (1080p)	115fps in Stalker (1080p)	68fps in Stalker (1080p)
Battery	74.7Wh lithium-polymer	73.26Wh lithium-polymer	49Wh lithium-ion	62Wh lithium-ion	91Wh lithium-ion
Battery life	1 hr 48 mins	1 hr 48 mins	2 hrs	5 hrs 5 mins	5 hrs
PCMark7 score	6304	6627	6241	5500	5833
Dimensions	425x303x24.5mm	330x263.5x22.9mm	418x269x39mm	374x250x37mm	372x254x18mm
Weight	3.24kg	1.8kg	3kg	2kg	2kg
Warranty	2-year return-to-base	2-year return-to-base	2-year return-to-base	2-year collect-and-return	1-year next day in-home
FULL REVIEW	TINYURL.COM/KLUXLGE	TINYURL.COM/LS86960	TINYURL.COM/PU5L5GK	TINYURL.COM/Q4JWVSM	TINYURL.COM/N9GRT4U

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Best budget laptops	1	2	3	4	5
	PC ADVISOR RECOMMENDED				
	Lenovo IdeaPad Z50-70	Dell Chromebook 11	Acer Aspire V13	HP 255 G3	Lenovo B50-30
Price	£399 inc VAT	£239 inc VAT	£410 inc VAT	£210 inc VAT	£200 inc VAT
Website	Lenovo.com/uk	Dell.co.uk	Acer.co.uk	Hp.com/uk	Lenovo.com/uk
Launch date	Jan 15	Dec 14	Jan 15	Jan 15	Jan 15
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	1.7GHz Intel Core i3-4010U	1.4GHz Intel Celeron 2955U	2GHz Intel Core i3-4158U	1.5GHz AMD A4-5000 (4C)	2.16GHz Intel Celeron
RAM	4GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3
Storage	1TB HDD	16GB SSD	500GB HDD with 8GB flash	500GB HDD	500GB HDD
Screen size	15.6in gloss	11.6in glossy	13.3in matt	15.6in matt	15.6in matt
Screen resolution	1920x1080	1366x768	1366x768	1366x768	1366x768
Graphics	nVidia GeForce 820M	Intel HD Graphics	Intel Iris Graphics 5100	AMD Radeon 8330	Intel HD Graphics
Video memory	2GB	N/A	N/A	N/A	N/A
Wireless	802.11b/g/n	802.11a/b/g/n	802.11a/b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	1x USB 3.0, 2x USB 2.0	2x USB 3.0	1x USB 3.0, 1x USB 2.0	1x USB 3.0, 2x USB 2.0	1x USB 3.0, 2x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	x	x	x	x	x
DisplayPort	x	x	x	x	x
HDMI	✓	✓	✓	✓	✓
DVI	x	x	x	x	x
VGA	✓	x	x	✓	✓
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack
Optical drive	DVD Writer	None	None	DVD Writer	DVD Writer
Extras	None	Webcam	None	None	None
Operating system	Windows 8.1	Google Chrome OS	Windows 8.1	Windows 8.1	Windows 8.1
Bundled software	None	None	None	None	None
Battery	41Wh Lithium-ion	Lithium	48Wh Lithium-ion	32Wh Lithium-ion	32Wh Lithium-ion
Battery life	4 hrs 58 mins	7 hrs 17 mins	6 hrs 35 mins	3 hrs 58 mins	4 hrs 51 mins
PC Mark 8 Home score	1959	N/A	2358 (3396 Work)	1646 (2266 Work)	N/A
Batman (Low/High)	33/29fps	N/A	29/24fps	23/20fps	N/A/8fps
Dimensions	382x265x27.5mm	295x201x24mm	327x227x20.6mm	377x257x26.5mm	380x260x26.5-32.5mm
Weight	2.4kg	1.3kg	1.5kg	2.1kg	2.2kg
Warranty	1-year return-to-base	1-year depot	1-year return-to-base?	1-year return-to-base	1-year return-to-base
FULL REVIEW	TINYURL.COM/NJNNKWQ	TINYURL.COM/M3D3QJ4	TINYURL.COM/MF4SHUZ	TINYURL.COM/NBUL2NO	TINYURL.COM/OQ94SKB

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Best ultraportable laptops	    				
	Apple MacBook Pro 13in Retina	Apple MacBook Air 13in	HP Spectre 13-3010ea	Toshiba Kira-101	MSI GS60 2PE Ghost Pro
Price	£1,399 inc VAT	£849 inc VAT	£999 inc VAT	£1,299 inc VAT	£1,360 inc VAT
Website	Apple.com/uk	Apple.com/uk	Hp.com/uk	Toshiba.co.uk	Uk.msi.com
Launch date	July 14	Apr 14	Sep 14	Aug 14	Dec 14
Build rating	★★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.8GHz Intel Core i5	1.4GHz Intel Core i5	1.6GHz Intel Core i5-4200U	1.8GHz Intel Core i7-4500U	2.4GHz Intel Core i7-4700HQ
RAM	8GB DDR3L	4GB DDR3L	8GB DDR3	8GB DDR3	8GB DDR3
Storage	512GB SSD	128GB SSD	256GB SSD	256GB SSD	2x 128GB SSD, 1TB HDD
Screen size	13.3in glossy (anti-glare)	13.3in glossy (anti-glare)	13.3in glossy	13.3in glossy	15.6in matt
Screen resolution	2560x1600	1440x900	1920x1080	2560x1440	1920x1080
Graphics	Intel Iris Graphics	Intel HD Graphics 5000	Intel HD Graphics 4400	Intel HD Graphics 4400	nVidia GeForce GTX 870M
Video memory	N/A	N/A	N/A	N/A	3GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11b/g/n/ac	802.11a/b/g/n/ac
Ethernet	Optional	Optional	None	None	None (mini)
Bluetooth	✓	✓	✓	✓	✓
USB	2x USB 3.0	2x USB 3.0	2x USB 3.0	3x USB 3.0	3x USB 3.0
FireWire	x	x	x	x	x
Thunderbolt	2x	✓	x	x	x
DisplayPort	x	✓	✓	x	✓ (mini)
HDMI	✓	x	✓	✓	✓
DVI	x	x	x	x	x
VGA	x	x	x	x	x
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	FaceTime HD webcam	HD webcam, multitouch trackpad, backlit keyboard	1080p webcam	720p webcam	720p webcam
Operating system	Mac OS X 10.10 Yosemite	Mac OS X 10.10 Yosemite	Windows 8.1 64-bit	Windows 8.1 Pro 64-bit	Windows 8.1 64-bit
Bundled software	iLife 11	iLife 11	None	None	None
Gaming scores	Not tested	Not tested	31fps in Stalker (720p)	17fps (1080p)	45fps Batman: Arkham City
Battery	71.8Wh lithium-polymer	54Wh lithium-polymer	51Wh lithium-ion	52Wh lithium-polymer	52Wh lithium-polymer
Battery life	9 hrs 55 mins	12 hrs 57 mins	7 hrs 30 mins	7 hrs 10 mins	1 hr 59 mins
PC Mark 7 score	Not tested	4602	5006	5100	5655
Dimensions	314x219x18mm	325x227x4-17.5mm	324x220x15mm	316x207x19.8mm	390x266x19mm
Weight	1.57kg	1.35kg	1.52kg	1.26kg	1.9kg
Warranty	1 year return-to-base	1-year return-to-base	2 year return-to-base	2-year onsite	2-year onsite
FULL REVIEW	TINYURL.COM/PNTUMPW	TINYURL.COM/KNXWZ3	TINYURL.COM/N4CJQL9	TINYURL.COM/QHP9F9T	TINYURL.COM/JVJBU39

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Best Chromebooks	1	2	3	4	5
	Toshiba Chromebook 2	Acer Chromebook 13	Dell Chromebook 11	HP Chromebook 14	Acer C720p
Price	£269 inc VAT	£219 inc VAT	£239 inc VAT	£259 inc VAT	£249 inc VAT
Website	Toshiba.co.uk	Acer.co.uk	Dell.co.uk	Hp.com/uk	Uk.asus.com
Launch date	Jan 15	Sep 14	Dec 14	Sep 14	Jan 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	Intel Celeron	2.1GHz nVidia Tegra K1	1.4GHz Intel Celeron 2955U	1.4GHz Intel Celeron 2955U	1.4GHz Intel Celeron 2955U
RAM	4GB DDR3	4GB DDR3	4GB DDR3	4GB DDR3	2GB DDR3
Storage	16GB SSD	32GB SSD	16GB SSD	16GB SSD	16GB SSD
Screen size	13.3in IPS	13.3in	11.6in glossy	14in glossy	11.6in glossy
Screen resolution	1920x1080	1920x1080	1366x768	1366x768	1366x768
Graphics	Intel HD graphics	nVidia Kepler	Intel HD Graphics	Intel HD graphics	Intel HD graphics
Video memory	N/A	N/A	N/A	N/A	N/A
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	1x USB 3.0, 1x USB 2.0	2x USB 3.0	2x USB 3.0	2x USB 3.0, 1x USB 2.0	1x USB 3.0, 1x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	x	x	x	x	x
DisplayPort	x	x	x	x	x
HDMI	✓	✓	✓	✓	✓
DVI	x	x	x	x	x
VGA	x	x	x	x	x
eSATA	x	x	x	x	x
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack	Headphone minijack
Optical drive	None	None	None	None	None
Extras	Webcam	Webcam	Webcam	Webcam	Webcam
Operating system	Google Chrome OS	Google Chrome OS	Google Chrome OS	Google Chrome OS	Google Chrome OS
Bundled software	None	None	None	None	None
Battery life	9 hrs	9 hrs 20 mins	7 hrs 17 mins	7 hrs 50 mins	6 hrs 7 mins
SunSpider score	Not tested	660ms	465ms	470ms	502ms
Peacekeeper score	Not tested	Not tested	2468	2478	2453
Browsermark score	Not tested	Not tested	3732	3643	3698
Dimensions	320x214x19.3mm	18x327x227.5mm	295x201x24mm	20.5x345x239mm	19.1x288x204mm
Weight	1.35kg	1.5kg	1.3kg	1.7kg	1.35kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OP9NQAY	TINYURL.COM/Q2YT5AD	TINYURL.COM/M3D3QJ4	TINYURL.COM/OCU7FTY	TINYURL.COM/O9KFZMA

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Best gaming laptops	    				
	1	2	3	4	5
	Aorus X7 v2	Gigabyte P35W v2	Aorus X7 Pro	Schenker XMG C504	Aorus X3 Plus
Price	£1,720 inc VAT	£1,399 inc VAT	£2,100 inc VAT	£1,099 inc VAT	£1,530 inc VAT
Website	Aorus.com	Uk.gigabyte.com	Aorus.com	Mysn.co.uk	Aorus.com
Launch date	Sep 14	Jun 14	Jan 15	Jan 15	Nov 14
Build rating	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★☆☆	★★★★☆	★★★☆☆	★★★★☆	★★★☆☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	2.4GHz Intel Core i7-4860HQ	2.5GHz Intel Core i7-4710HQ	2.4GHz Intel Core i7-4860HQ	2.5GHz Intel Core i7-4710HQ	2.4GHz Intel Core i7-4860HQ
RAM	16GB DDR3	16GB DDR3L	16GB DDR3	8GB DDR3	16GB DDR3
Storage	1TB HDD, 3x 128GB SSD	1TB HDD, 2x 128GB SSD	2x 256GB SSD	1TB HDD, 2x 120GB SSD	2x 128GB SSD
Screen size	17.3in matt	15.6in matt	17.3in matt	15.6in matt	14in matt
Screen resolution	1920x1080	1920x1080	1920x1080	1920x1080	3200x1800
Graphics	2x nVidia GeForce GTX 860M	Intel HD 4600/GeForce 870M	2x nVidia GTX 870M	Intel HD 4600/GeForce 860M	nVidia GeForce GTX 870M
Video memory	8GB	6GB	6GB	4GB	6GB
Wireless	802.11a/b/g/n/ac	802.11a/b/g/n	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	✓	✓	✓	✓	✓
USB	3x USB 3.0, 2x USB 2.0	2x USB 3.0, 2x USB 2.0	3x USB 3.0, 2x USB 2.0	2x USB 3.0, 2x USB 2.0	2x USB 3.0, 1x USB 2.0
FireWire	✗	✗	✗	✗	✗
Thunderbolt	✗	✗	✗	✗	✗
DisplayPort	✓	✓	✓	✓	✓
HDMI	✓	✓	✓	✓	✓
DVI	✗	✗	✗	✗	✗
VGA	✓	✓	✓	✓	✗
eSATA	✗	✗	✗	✗	✗
Media card slot	✓	✓	✓	✓	✓
Audio	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic	Headphone jack, mic
Optical drive	N/A	N/A	N/A	N/A	N/A
Extras	HD webcam	HD webcam	HD webcam	HD webcam	HD webcam
Operating system	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64bit
Bundled software	None	None	None	None	None
Gaming scores	189/157fps in Tomb Raider	60/40fps in Tomb Raider	221/170fps in Tomb Raider	105fps in Stalker (1080p)	60.9/38.3fps in Tomb Raider
Battery	74.7Wh lithium-polymer	75.8Wh lithium-polymer	74.7Wh lithium-polymer	78Wh lithium-ion	73.26Wh lithium-polymer
Battery life	1 hr 48 mins	4 hrs	1 hr 48 mins	3 hrs 45 mins	1 hr 48 mins
PC Mark 7 score	6304	6226	6474	5635	6627
Dimensions	425x303x24.5mm	385x270x20.9mm	425x303x24.5mm	385x270x21mm	330x263.5x22.9mm
Weight	3.24kg	2.5kg	3.24kg	2.16kg	1.8kg
Warranty	2-year return-to-base	2-year	2-year return-to-base	2-year collect-and-return	2-year return-to-base
FULL REVIEW	TINYURL.COM/KLUXLGE	TINYURL.COM/O9WUF8S	TINYURL.COM/OZVQ6JQ	TINYURL.COM/QDV7234	TINYURL.COM/LS86960

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Best family PCs	1	2	3	4	5
	Chillblast Fusion Commando	Wired2Fire Diablo Reactor	Mesh Elite 4670-PCA	Dino PC Raging Lizard V2	Arbico Family i3 4185
Price	£799 inc VAT	£668 inc VAT	£799 inc VAT	£780 inc VAT	£675 inc VAT
Website	Chillblast.com	Wired2fire.co.uk	Meshcomputers.com	Dinopc.com	Arbico.co.uk
Launch date	Jul 13	May 14	May 14	May 14	May 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.2GHz Intel Core i5-4570	3.4GHz Intel Core i5-4670	3.4GHz Intel Core i5-4670	3.5GHz Intel Core i5-4690	3.4GHz Intel Core i3-4130
RAM	16GB DDR3	8GB DDR3 1600MHz	16GB DDR3 1600MHz	8GB DDR3 1600MHz	8GB DDR3 1600MHz
Storage	1TB HDD + 120GB SSD	1TB HDD	2TB HDD + 120GB SSD	1TB HDD + 128GB SSD	1TB HDD + 120GB SSD
Motherboard	Asus B85M-G	Asus B85M-G	MSI B85M-E45	Gigabyte H97M-D3H	MSI B85M-E45
CPU cooler	Arctic Cooling Freezer 7 Pro	Standard Intel Cooler	Standard Intel Cooler	Standard Intel Cooler	Arctic Cooling Freezer 7 Pro
Power supply	600W CIT	500W FSP	500W FSP	500W CIT	650W Arctic Red
Screen	23in Iiyama X2377	24in AOC E2495Sh	24in Iiyama E2483HS-B1	24in Iiyama E2483HS-B1	23.6in AOC E2470SWHE
Screen resolution	1920x1080	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Graphics	Zotac nVidia GeForce GTX 650 Ti	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti	nVidia GeForce GTX 750 Ti	MSI AMD Radeon R7 250
Video memory	N/A	2GB	2GB	2GB	2GB
Connectivity	802.11b/g/n, gigabit ethernet	Gigabit ethernet	Gigabit ethernet	Gigabit ethernet, 802.11b/g/n	Gigabit ethernet
USB	3x USB 3.0, 6x USB 2.0	3x USB 3.0, 6x USB 2.0, 2x HDMI, VGA	4x USB 3.0, 8x USB 2.0, HDMI, VGA, DVI-D, DVI, DP	5x USB 3.0, 3x USB 2.0, 2x HDMI (1x e-Mini), VGA, 2x DVI	2x USB 3.0, 6x USB 2.0, HDMI, VGA, DVI-D
Media card slot	None	None	None	None	None
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Speakers	2x Logitech LS220	None	None	None	None
Case	Cooler Master Force 500	Zalman Z3 Plus	Zalman Z3 Plus	Fractal Design Core 1000 USB3	CIT Templar
Keyboard	Logitech MK260	Octigen Wireless combo	Logitech MK270 (wireless combo)	Gigabyte KM6150 (wired combo)	Logitech MK120
Optical drive	LG BD-ROM/DVD±RW	LiteOn DVD RW	24x DVD RW	None	Samsung DVD RW
Operating system	Windows 8 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Bundled software	None	None	None	None	Ahead Nero, CyberLink PowerDVD
Sniper V2 Elite score (Low/High/Ultra)	147/59/14fps	240/76/18fps	195/68/16fps	196/83/20fps	62/22/5fps
Alien vs Predator score (720p/1080p)	52/27fps	83/44fps	71/37fps	102/53fps	22/11fps
PCMark 7 score	6177	3938	7304	6431	4800
Warranty	2-year collect-and-return	2-year return-to-base	3-years labour (2-year parts, 3-months free C&R)	3-year labour (2-year parts)	2-year return-to-base
FULL REVIEW	TINYURL.COM/KF6G3T7	TINYURL.COM/OA8UKDP	TINYURL.COM/OZCSHYU	TINYURL.COM/PFA55F7	TINYURL.COM/NU7FSGB

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Fusion **MANTIS** Gaming PC

- NZXT Source 340 Mid Tower Case
- Intel® Core™ i5-4690K Processor
- Corsair H55 Liquid Cooler
- Gigabyte Z97-HD3 Motherboard
- 8GB 1600MHz DDR3 Memory
- GeForce GTX 960 2GB GPU
- 1TB Seagate SSHD Hybrid Drive
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Defiant 2 Gaming Laptop



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- Intel® Core™ i7-4710MQ Processor
- 13.3" Full HD Display
- 8GB 1600MHz DDR3 Memory
- GeForce GTX 860M 2GB GPU
- 1000GB 2.5" Seagate Hybrid SSHD
- Microsoft Windows 8.1
- 330mm x 227mm x 31mm

From **£899.00** inc VAT

Fusion Nano Gaming PC



PC ADVISOR
★★★★★



- Intel® Core™ i5-4690K Processor
- Asus Z97I-PLUS WIFI Motherboard
- 16GB 1600MHz DDR3 Memory
- GeForce GTX 970 4GB Mini GPU
- 250GB Solid State Drive
- 1TB 2.5" Seagate Hybrid SSHD
- Microsoft Windows 8.1

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Fusion Dragon Gaming PC



PC ADVISOR
★★★★★



- Intel® Core™ i7-4790K Processor
- Asus Sabertooth Z97 Mark 1
- 16GB 1600MHz DDR3 Memory
- GeForce GTX 980 4GB GPU
- 250GB Solid State Drive
- 2000GB Hard Disk Drive
- Microsoft Windows 8.1

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** Chillblast won more awards in the leading IT press publications PC Pro, PC Advisor and Computer Shopper combined than any other retailer 2010-2013

*** World's fastest PC as tested by PC Pro Magazine <http://www.pcpro.co.uk/reviews/desktops/371152/chillblast-fusion-photo-oc-iv>
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Best gaming PCs					
	1 PC ADVISOR GOLD	2	3	4 PC ADVISOR RECOMMENDED	5
	Chillblast Fusion Probe	Chillblast Fusion Ranger	Gladiator Firestorm OC	CyberPower Infinity Perseus XT	Computer Planet GX 760
Price	£1,299 inc VAT	£1,249 inc VAT	£695 inc VAT	£1,499 inc VAT	£983 inc VAT
Website	Chillblast.com	Chillblast.com	Gladiatorpc.co.uk	Cyberpowersystem.co.uk	Computerplanet.co.uk
Launch date	Feb 14	Jul 14	Mar 14	Feb 14	Mar 14
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★★	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Processor	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K (OC 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.2GHz)	3.4GHz Intel Core i5-4670K (OC 4.4GHz)	3.4GHz Intel Core i5-4670K
CPU cooler	Corsair H55 Liquid Cooler	Corsair H60 Liquid Cooler	Be Quiet Dark Rock 3	Cooler Master Seldon 120mm	Corsair H60 Hydro
Memory	16GB DDR3	16GB DDR3	8GB DDR3	16GB DDR3	8GB DDR3
Storage	120GB SSD + 2TB HDD	120GB SSD + 2TB HDD	2TB HDD	256GB SSD + 2TB HDD	120GB SSD + 2TB HDD
Power supply	750W Corsair	750W Corsair	500W Corsair	750W Corsair	450W Corsair
Motherboard	Gigabyte GA-Z87N-Wi-Fi	Asus Maximus VII Ranger	MSI Z87M Gaming	Gigabyte GA-Z87-HD3	Gigabyte GA-Z87N-Wi-Fi
Operating system	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Screen	23.6in Iiyama X2377HDS	None supplied	None supplied	23in AOC i2367fh	None supplied
Graphics	Palit Jetstream GeForce GTX 780, 3GB VRAM	PowerColor AMD Radeon R9 290 OC, 4GB VRAM	MSI nVidia GeForce GTX 750 Ti Gaming, 2GB VRAM	Powercolor AMD R9 290, 4GB VRAM	Zotac GeForce GTX 760, 2GB VRAM
Sound	Onboard	Onboard	Onboard	Onboard	Onboard
Connectivity	Gigabit ethernet, 802.11n	Gigabit ethernet	Low-lag ethernet	Gigabit ethernet	2x gigabit ethernet, 802.11n
Ports	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0, 2x DVI, HDMI, DP	8x USB 3.0, 4x USB 2.0, 2x eSATA	6x USB 3.0, 4x USB 2.0	6x USB 3.0, 2x USB 2.0
Optical drive	DVD±RW (Blu-ray optional)	24x DVD±RW	24x DVD±RW	DVD±RW, BD-ROM	None supplied
Case	Aerocool Dead Silence Gaming Cube	Corsair Graphite 230T	Aerocool Dead Silence Cube Window Red	Cooler Master Dominator 690 III	Fractal Design Node 304
Keyboard & mouse	Gigabyte M6800 mouse, Force K3 keyboard	None	None	Gigabyte M6900 mouse, Force K3 keyboard	None
Other	Optional family pack	None	None	None	None
PC Mark 7 score	6965	6852	5124	6731	5508
Alien vs Predator score (720p/1080p)	169/93fps	173/97	103/54fps	172/96fps	103/54fps
Final Fantasy XIV (720p/1080p)	218/96fps	N/A	N/A	167/87fps	N/A
Sniper Elite V2 (Low/High/Ultra)	308/187/49fps	321/164/42	194/81.6/18.6fps	352/155/39fps	261/119/29fps
Power Consumption	52/407W	67W/386W	70W/166W	68/484W	53W/271W
Warranty	2-year collect-and-return	2-year collect-and-return	4-year return-to-base	3-year RTB (2 years parts, 3 years labour)	3-year return-to-base
FULL REVIEW	TINYURL.COM/OWQ24QQ	TINYURL.COM/MEGK909	TINYURL.COM/PKDV2NG	TINYURL.COM/NKWN7V4	TINYURL.COM/MJKS7G

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All-in-one PCs	1  PC ADVISOR RECOMMENDED	2 	3 	4 	5 
	Apple iMac with 5K display	Acer Aspire AZ3-615	Chillblast Volante A10	Asus Eee Top	HP Envy Beats 23-n001na
Price	£1,999 inc VAT	£799 inc VAT	£1,299 inc VAT	£799 inc VAT	£900 inc VAT
Website	Apple.com/uk	Acer.co.uk	Chillblast.com	Asus.com/uk	Hp.com/uk
Launch date	Dec 14	Dec 14	Dec 14	Dec 14	Dec 14
Build rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★★	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Processor	3.9GHz Intel Core i5-4690	2.7GHz Intel Core i5-4460T	4GHz Intel Core i7-4790S	2.6GHz Intel Core i5-4200U	3.2GHz Intel Core i7-4785T
RAM	8GB DDR3	8GB DDR3	16GB DDR3	6GB DDR3	8GB DDR3
Storage	1TB Fusion Drive	1TB HDD	1TB SSD	1TB HDD	1TB HDD
Screen	27in	23in touchscreen	24in	23in touchscreen	23in touchscreen
Screen resolution	5120x2880	1920x1080	1920x1080	1920x1080	1920x1080
Graphics card	AMD Radeon M9 M290X	nVidia GeForce GT 840M	nVidia GeForce GT 750M	Intel HD Graphics 4400	Intel HD Graphics 4600
Video memory	2GB	2GB	2GB	N/A	N/A
Wireless	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Ethernet	Gigabit	Gigabit	Gigabit	Gigabit	Gigabit
Bluetooth	x	x	x	x	x
USB	4x USB 3.0	2x USB 3.0, 3x USB 2.0	4x USB 3.0, 2x USB 2.0	3x USB 3.0, 3x USB 2.0	2x USB 3.0, 4x USB 2.0
FireWire	x	x	x	x	x
Thunderbolt	✓	x	x	x	x
HDMI	x	x	✓	✓	✓
Media card slot	✓	✓	✓	✓	✓
Optical drive	None	DVD Writer	Blu-Ray Combo	DVD Writer	DVD Writer
Other	Final Cut Pro X, Logic Pro X, Aperture	1Mp webcam, wireless keyboard and mouse	Logitech MK520 wireless keyboard and mouse	2Mp webcam, Freeview TV, wireless keyboard and mouse	Wireless keyboard and mouse, Beats Audio stereo speaker system (8x 12W)
Operating system	OS X Yosemite	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit	Windows 8.1 64-bit
Power consumption (idle/max)	46/215W	46/91W	35/177W	33/69W	43/81W
Sniper V2 Elite (Low/High/Ultra)	113.8/84/21.2fps	47.7/18.7/5.1fps	91.5/41.2/10.5fps	31.4/7.8/5fps	27.7/7.4/5fps
PCMark 8 Home score	4008	2906	3776	2828	2702
Dimensions	650x203x516mm	540x489x579mm	585x200x450mm	571x359x50-214mm	563x143x413mm
Weight	9.54kg	8.8kg	14.6kg	9kg	8.4kg
Warranty	1-year return-to-base	Not stated	5-year labour (2-year collect-and-return)	1-year return-to-base	1-year limited parts, labour, and pickup-and-return service
FULL REVIEW	TINYURL.COM/NWJUJSF	TINYURL.COM/QEY8FOE	TINYURL.COM/LO8A5MC	TINYURL.COM/PRPHC7L	TINYURL.COM/O6M4BCN

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Best smartphones	    				
	LG G3	Sony Xperia Z3 Compact	HTC One M9	LG G2	HTC One M8
Price	£479 inc VAT	£349 inc VAT	£579 inc VAT	£279 inc VAT	£550 inc VAT
Website	Lg.com/uk	Sony.co.uk	HTC.com/uk	Lg.com/uk	HTC.com/uk
Launch date	May 14	Sep 14	Mar 15	Sep 13	Apr 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OS (out of box)	Android 4.4 KitKat	Android 4.4 KitKat	Android 5.0 Lollipop	Android 4.2 Jelly Bean	Android 4.4 KitKat
Processor	2.5GHz Snapdragon 801	2.5GHz Snapdragon 801	Snapdragon 810 octa-core	2GHz Snapdragon 800	2.3GHz Snapdragon 801
RAM	2GB/3GB	2GB	3GB	2GB	2GB
Storage	16GB/32GB	16GB	32GB	16GB/32GB	16GB
MicroSD support	No	Up to 128GB	Up to 128GB	No	Up to 128GB
Graphics	Adreno 330	Adreno 330	Adreno 430	Adreno 330	Adreno 330
Screen size	5.5in	4.6in	5in	5.2in	5in
Screen resolution	1440x2560 (Quad-HD)	720x1280 (HD)	1080x1920 (full-HD)	1080x1920 (full-HD)	1080x1920 (full-HD)
Pixel density	534ppi	319ppi	441ppi	424ppi	441ppi
Screen technology	IPS	IPS	IPS	IPS	IPS
Front camera	2Mp	2.2Mp	4Mp (UltraPixel)	2Mp	5Mp
Rear camera	13Mp, LED flash	20.7Mp, LED flash	20Mp	13Mp, LED flash	4Mp (UltraPixel), LED flash
Video recording	4K	4K	4K	1080p	1080p
Cellular connectivity	4G	4G	4G	4G	4G
SIM type	Micro-SIM	Nano-SIM	Nano-SIM	Micro-SIM	Nano-SIM
Dual-SIM as standard	No	No	No	No	No
Wi-Fi	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11b/g/n	802.11a/b/g/n/ac, dual-band
Bluetooth	Bluetooth 4.0 (aptX)	Bluetooth 4.0	Bluetooth 4.1 (aptX)	Bluetooth 4.0	Bluetooth 4.0 (aptX)
GPS	A-GPS, Glonass	A-GPS, Glonass	GPS, Glonass	A-GPS, Glonass	GPS, Glonass
NFC	Yes	Yes	Yes	Yes	Yes
USB OTG	Yes	Yes	Yes	Yes	Yes
Extra features	24bit/192kHz audio, rear key	Waterproof, PS4 Remote Play	BoomSound speakers	24bit/192kHz audio	BoomSound speakers
Geekbench 3.0 (single)	Not tested	Not tested	1160	848	962
Geekbench 3.0 (multi)	2465	2800	3378	2221	2761
SunSpider	959ms	944ms	867ms	901ms	583ms
GFXBench: T-Rex	20fps	41fps	50fps	23fps	30fps
GFXBench: Manhattan	Not tested	26fps	24fps	Not tested	12fps
Battery	3000mAh, removable, Qi	2600mAh, non-removable	2840mAh, non-removable	3000mAh, non-removable	2600mAh, non-removable
Dimensions	75x146x8.9mm	64.9x127x8.6mm	70x145x9.7mm	71x139x9.4mm	70.6x146.4x9.4mm
Weight	149g	129g	157g	143g	160g
Warranty	1 year	2 years	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OA76T73	TINYURL.COM/NBBUY82	TINYURL.COM/PUS2XEJ	TINYURL.COM/PAFK4SZ	TINYURL.COM/POWMGVX

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Best budget smartphones	1	2	3	4	5
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Motorola Moto G 3G 2014	Motorola Moto E 4G 2015	Motorola Moto G 4G 2014	Motorola Moto G 4G 2015	Doogee F1 Turbo Mini
Price	£140 inc VAT	£109 inc VAT	£117 inc VAT	£149 inc VAT	£102 inc VAT
Website	Motorola.co.uk	Motorola.co.uk	Motorola.co.uk	Motorola.co.uk	Coolicool.com
Launch date	Sep 14	Feb 15	May 14	Mar 15	Jan 15
Build rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Features rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Performance rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Value rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
OS (out of box)	Android 4.4 KitKat	Android 5.0 Lollipop	Android 4.4 KitKat	Android 5.0 Lollipop	Android 4.4 KitKat
Processor	1.2GHz Snapdragon 400	1.2GHz Snapdragon 410	1.2GHz Snapdragon 400	1.2GHz Snapdragon 400	1.5GHz MediaTek MT6732
RAM	1GB	1GB	1GB	1GB	1GB
Storage	8GB	8GB	8GB	8GB	8GB
MicroSD support	Up to 32GB	Up to 32GB	Up to 32GB	Up to 32GB	Up to 64GB
Graphics	Adreno 305	Adreno 306	Adreno 305	Adreno 305	ARM Mali-T760
Screen size	5in	4.5in	4.5in	5in	4.5in
Screen resolution	720x1280 (HD)	540x960 (qHD)	720x1280 (HD)	720x1280 (HD)	540x960 (qHD)
Pixel density	294ppi	245ppi	326ppi	294ppi	245ppi
Screen technology	IPS	IPS	IPS	IPS	IPS
Front camera	2Mp	0.3Mp	1.3Mp	2Mp	5Mp
Rear camera	8Mp, LED flash	5Mp	5Mp, LED flash	8Mp, LED flash	8Mp, LED flash
Video recording	720p	720p	720p	720p	720p
Cellular connectivity	3G	4G	4G	4G	4G
SIM type	Micro-SIM	Micro-SIM	Micro-SIM	Micro-SIM	Micro-SIM + Mini-SIM
Dual-SIM as standard	Yes	No	No	No	Yes, dual-standby
Wi-Fi	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n	802.11b/g/n
Bluetooth	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0
GPS	A-GPS, Glonass	GPS, A-GPS, Glonass	A-GPS, Glonass	A-GPS, Glonass	GPS
NFC	No	No	No	No	No (HotKnot)
USB OTG	Yes	No	Yes	Yes	Yes
Extra features	Stereo speakers	Double-twist launches camera, lockscreen alerts	None	Stereo speakers	Useful gestures, Visitor mode
Geekbench 3.0 (single)	340	464	334	345	647
Geekbench 3.0 (multi)	1144	1463	1168	1182	1947
SunSpider	1526ms	1301ms	1504ms	1968ms	1133ms
GFXBench: T-Rex	11fps	13fps	11fps	11fps	25fps
GFXBench: Manhattan	4fps	6fps	Not tested	4fps	13fps
Battery	2390mAh, non-removable	2390mAh, non-removable	2070mAh, non-removable	2390mAh, non-removable	2000mAh, removable
Dimensions	71x142x11mm	66.8x5.2-12.3x129.9mm	66x130x11.6mm	71x142x11mm	65x8x132mm
Weight	155g	145g	143g	155g	112g
Warranty	1 year	1 year	1 year	1 year	See Coolicool.com
FULL REVIEW	TINYURL.COM/OAE6AH5	TINYURL.COM/Q7Q9NXR	TINYURL.COM/Q7Q9NXR	TINYURL.COM/Q9RQCKU	TINYURL.COM/NCQJXHN

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Best phablets	    				
	1	2	3	4	5
	Samsung Galaxy Note 4	LG G3	OnePlus One	Google Nexus 6	Apple iPhone 6 Plus
Price	£599 inc VAT	£479 inc VAT	£229 inc VAT	£499 inc VAT	£619 inc VAT
Website	Samsung.com/uk	Lg.com/uk	Oneplus.net	Play.google.com	Apple.com/uk
Launch date	Sep 14	May 14	Jul 14	Oct 14	Sep 14
Build rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Features rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Performance rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Value rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Overall rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
OS (out of box)	Android 4.4 KitKat	Android 4.4 KitKat	Cyanogen 11S (Android 4.4)	Android 5.0 Lollipop	iOS 8
Processor	2.7GHz Snapdragon 805	2.5GHz Snapdragon 801	2.5GHz Snapdragon 801	2.7GHz Snapdragon 805	Apple A8
RAM	3GB	2GB/3GB	3GB	3GB	1GB
Storage	32GB	16GB/32GB	16GB/64GB	32GB/64GB	16GB/64GB/128GB
MicroSD support	Up to 128GB	No	No	No	No
Graphics	Adreno 420	Adreno 330	Adreno 330	Adreno 420	Apple M8
Screen size	5.7in	5.5in	5.5in	5.96in	5.5in
Screen resolution	1440x2560 (Quad-HD)	1440x2560 (Quad-HD)	1920x1080 (full-HD)	1440x2560 (Quad-HD)	1920x1080 (full-HD)
Pixel density	515ppi	534ppi	401ppi	493ppi	401ppi
Screen technology	Super AMOLED	IPS	IPS	IPS	IPS
Front camera	3.7Mp	2Mp	5Mp	2Mp	1.2Mp
Rear camera	16Mp, LED flash	13Mp, LED flash	13Mp, LED flash	13Mp, LED flash	8Mp, LED flash
Video recording	4K	4K	4K	4K	720p
Cellular connectivity	4G	4G	4G	4G	4G
SIM type	Micro-SIM	Micro-SIM	Micro-SIM	Nano-SIM	Nano-SIM
Dual-SIM as standard	No	No	No	No	No
Wi-Fi	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band
Bluetooth	Bluetooth 4.1	Bluetooth 4.0 (aptX)	Bluetooth 4.0	Bluetooth 4.1	Bluetooth 4.0
GPS	GPS, Glonass	A-GPS, Glonass	GPS, Glonass	GPS, Glonass	GPS, Glonass
NFC	Yes	Yes	Yes	Yes	Yes, but only for Apple Pay
USB OTG	Yes	Yes	Yes	Yes	No
Extra features	Fingerprint, UV, heart-rate sensors, S Pen stylus	24bit/192kHz audio, rear key	None	None	TouchID fingerprint scanner
Geekbench 3.0 (single)	Not tested	Not tested	969	Not tested	Not tested
Geekbench 3.0 (multi)	3272	2465	2570	3304	2917
SunSpider	1367ms	959ms	877ms	791ms	369ms
GFXBench: T-Rex	27fps	20fps	29fps	27fps	41fps
GFXBench: Manhattan	11fps	Not tested	Not tested	12fps	19fps
Battery	3220mAh, removable	3000mAh, removable, Qi	3100mAh, non-removable	3220mAh, non-removable, Qi	2915mAh, non-removable
Dimensions	78.6x153.5x8.5mm	75x146x8.9mm	75.9x152.9x8.9mm	82x159x10.4mm	77.8x158.1x7.1mm
Weight	176g	149g	162g	183g	172g
Warranty	2 years	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/PNHJCZ4	TINYURL.COM/OA76T73	TINYURL.COM/PK3S5CP	TINYURL.COM/NLZ4UD9	TINYURL.COM/O9RX9UN

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Best 7- & 8in tablets



	Google Nexus 7	Samsung Galaxy Tab S 8.4	Sony Xperia Z3 Tablet Compact	Apple iPad mini 2	Google Nexus 9
Price	£199 inc VAT	£319 inc VAT	£299 inc VAT	£239 inc VAT	£319 inc VAT
Website	Play.google.com	Samsung.com/uk	Sony.co.uk	Apple.com/uk	Play.google.com
Launch date	Aug 13	Aug 14	Sep 14	Oct 13	Oct 14
Build rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Features rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Performance rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Value rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
OS (out of box)	Android 4.3 Jelly Bean	Android 4.4 KitKat	Android 4.4 KitKat	iOS 8.2	Android 5.0 Lollipop
Processor	1.5GHz Snapdragon S4 Pro	Exynos 5420, octa-core	2.5GHz Snapdragon 801	Apple A7, Apple M7	2.3GHz nVidia Tegra K1
RAM	2GB	3GB	3GB	1GB	2GB
Storage	16GB/32GB	16GB/32GB	16GB/32GB	16GB/32GB	16GB/32GB
MicroSD support	No	Up to 128GB	Up to 128GB	No	No
Graphics	Adreno 320	ARM Mali-T628 MP6	Adreno 330	Apple A7	192-core Kepler
Screen size	7in	8.4in	8in	7.9in	8.9in
Screen resolution	1920x1200 (full-HD)	2560x1440 (WQXGA)	1920x1200 (full-HD)	2048x1536 (full-HD)	2048x1536 (full-HD)
Pixel density	323ppi	359ppi	283ppi	326ppi	287ppi
Screen technology	IPS	Super AMOLED	IPS	IPS	IPS
Front camera	1.2Mp	2.1Mp	2.2Mp	1.2Mp	1.6Mp
Rear camera	5Mp	8Mp, LED flash	8.1Mp	5Mp	8Mp, LED flash
Video recording	1080p	1080p	1080p	1080p	1080p
Cellular connectivity	4G version available	4G version available	4G version available	4G version available	4G version available
Wi-Fi	802.11b/g/n, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n, dual-band	802.11a/b/g/n/ac, dual-band
Bluetooth	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.1
GPS	GPS, Glonass	GPS, Glonass	A-GPS, Glonass	A-GPS, Glonass	GPS, Glonass
NFC	Yes	No	Yes	No	Yes
USB OTG	Yes	Yes	Yes	No	Yes
Fingerprint scanner	No	Yes	No	No	No
Waterproof	No	No	Yes	No	No
Extra features	None	Stereo speakers	PS4 Remote Play, stereo speakers	None	BoomSound speakers
Geekbench 3.0 (single)	Not tested	Not tested	Not tested	Not tested	1904
Geekbench 3.0 (multi)	Not tested	2765	2708	Not tested	3352
SunSpider	1136ms	1089ms	1017ms	397ms	955ms
GFXBench: T-Rex	Not tested	14fps	28fps	Not tested	48fps
GFXBench: Manhattan	Not tested	3fps	11fps	Not tested	22fps
Battery	3950mAh, non-removable, Qi	4900mAh, non-removable	4500mAh, non-removable	6470mAh, non-removable	6700mAh, non-removable
Dimensions	200x114x8.65mm	126x213x6.6mm	213x124x6.4mm	134.7x7.5x200mm	153.7x228.3x8mm
Weight	299g	294g	270g	331g	425g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/PUJDJB	TINYURL.COM/OUEM64Z	TINYURL.COM/NJ6VHEO	TINYURL.COM/PCJPB5L	TINYURL.COM/NQ6K77Y

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Best 9- & 10in tablets	 1 PC ADVISOR GOLD	 2 PC ADVISOR RECOMMENDED	 3 PC ADVISOR RECOMMENDED	 4 PC ADVISOR RECOMMENDED	 5 PC ADVISOR RECOMMENDED
	Apple iPad Air 2	Samsung Galaxy Tab S 10.5	Sony Xperia Z2 Tablet	Apple iPad Air	Google Nexus 10
Price	£399 inc VAT	£399 inc VAT	£369 inc VAT	£319 inc VAT	£389 inc VAT
Website	Apple.com/uk	Samsung.com/uk	Sony.co.uk	Apple.com/uk	Play.google.com
Launch date	Oct 14	Aug 14	Mar 14	Oct 13	Oct 12
Build rating	★★★★★★	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Features rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Performance rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Value rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Overall rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
OS (out of box)	iOS 8.2	Android 4.4 KitKat	Android 4.4 KitKat	iOS 8.2	Android 4.2 Jelly Bean
Processor	Apple A8X, Apple M8	Exynos 5420, octa-core	2.3GHz Snapdragon 801	Apple A7, Apple M7	1.7GHz Exynos 5250
RAM	2GB	3GB	3GB	1GB	2GB
Storage	16GB/64GB/128GB	16GB/32GB	16GB	16GB/32GB	16GB/32GB
MicroSD support	No	Up to 128GB	Up to 64GB	No	No
Graphics	Apple A8X	ARM Mali-T628 MP6	Adreno 330	Apple A7	ARM Mali T604
Screen size	9.7in	10.5in	10.1in	9.7in	10.1in
Screen resolution	2048x1536 (full-HD)	2560x1600 (WQXGA)	1920x1200 (full-HD)	2048x1536 (full-HD)	2560x1600 (WQXGA)
Pixel density	264ppi	288ppi	224ppi	264ppi	300ppi
Screen technology	IPS	Super AMOLED	IPS	IPS	IPS
Front camera	1.2Mp	2.1Mp	2.2Mp	1.2Mp	1.9Mp
Rear camera	8Mp	8Mp, LED flash	8.1Mp	5Mp	5Mp, LED flash
Video recording	1080p	1080p	1080p	1080p	1080p
Cellular connectivity	4G version available	4G version available	4G version available	4G version available	No
Wi-Fi	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n/ac, dual-band	802.11a/b/g/n, dual-band	802.11b/g/n, dual-band
Bluetooth	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0	Bluetooth 4.0
GPS	A-GPS, Glonass	GPS, Glonass	GPS, Glonass	A-GPS, Glonass	GPS, Glonass
NFC	Yes (for Apple Pay)	No	Yes	No	Yes
USB OTG	No	Yes	Yes	No	Yes
Fingerprint scanner	Yes	Yes	No	No	No
Waterproof	No	No	Yes	No	No
Extra features	None	Stereo speakers	PlayStation certified	None	None
Geekbench 3.0 (single)	1816	Not tested	967	1487	Not tested
Geekbench 3.0 (multi)	4523	2769	2719	2703	Not tested
SunSpider	Not tested	1079ms	1099ms	400ms	1329ms
GFXBench: T-Rex	48fps	14fps	27fps	23fps	Not tested
GFXBench: Manhattan	Not tested	3fps	Not tested	Not tested	Not tested
Battery	7340mAh, non-removable	7900mAh, non-removable	6000mAh, non-removable	8600mAh, non-removable	9000mAh, non-removable
Dimensions	240x169.5x6.1mm	247x177x6.6mm	266x172x6.4mm	240x169x7.5mm	264x178x8.9mm
Weight	437g	465g	439g	469g	603g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/PLQXWSZ	TINYURL.COM/OESDFZQ	TINYURL.COM/M8BZZUN	TINYURL.COM/NVOOF6H	TINYURL.COM/PUAG9RN






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Best smartwatches	1	2	3	4	5
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	LG G Watch R	Motorola Moto 360	Sony Smartwatch 3	Asus ZenWatch	LG G Watch
Price	£195 inc VAT	£199 inc VAT	£189 inc VAT	£199 inc VAT	£159 inc VAT
Website	Lg.com/uk	Motorola.co.uk	Sony.co.uk	Uk.asus.com	Lg.com/uk
Launch date	Nov 14	Oct 14	Sep 14	Jan 15	Jul 14
Overall rating	★★★★★	★★★★★	★★★★☆	★★★★☆	★★★★★
Operating system	Android Wear	Android Wear	Android Wear	Android Wear	Android Wear
Compatibility	Android	Android	Android	Android	Android
Display	1.3in 320x320 P-OLED	1.56in 290x320 LCD	1.6in 320x320 LCD	1.6in 320x320 AMOLED	1.65in 280x280 IPS
Processor	1.2GHz Snapdrgon 400	Ti OMAP 3	1.2GHz ARM V7	1.2GHz Snapdragon 400	1.2GHz Snapdragon 400
RAM	512MB	512MB	512MB	512MB	512MB
Storage	4GB	4GB	4GB	4GB	4GB
Waterproof	Yes	Yes	Yes	Yes	Yes
Battery	410mAh	320mAh	420mAh	1.4Wh	400mAh
Dimensions	46.4x53.6x9.7mm	46x11.5mm	36x51x10mm	51 x39.9x7.9-9.4mm	37.9x46.5x9.95mm
Weight	62g	49g (leather band model)	45g	75g	63g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/QATY8FT	TINYURL.COM/O9C69K6	TINYURL.COM/OQVZ3PN	TINYURL.COM/NN7GA7W	TINYURL.COM/Q84WL6L






Best smartwatches	6	7	8	9	10
	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED	PC ADVISOR RECOMMENDED
	Pebble Steel	Sony Smartwatch 2	Samsung Gear 2 Neo	Martian Notifier	Samsung Gear 2
Price	£179 inc VAT	£125 inc VAT	£169 inc VAT	£99 inc VAT	£260 inc VAT
Website	Getpebble.com	Sony.co.uk	Samsung.com/uk	Martianwatches.com	Samsung.com/uk
Launch date	Sep 14	Jun 13	Apr 14	Dec 14	Apr 14
Overall rating	★★★★★	★★★★★	★★★★☆	★★★★☆	★★★★☆
Operating system	Proprietary	Proprietary	Tizen	Proprietary	Tizen
Compatibility	iOS, Android	Android	Samsung phones	iOS, Android	Samsung phones
Display	1.26in 144x168 E-Paper	1.6in 220x176 LCD	1.6in 320x320 Super AMOLED	1.01in 96x16 OLED	1.6in 320x320 Super AMOLED
Processor	Not specified	Not specified	Dual-core	Not specified	1GHz dual-core
RAM	512MB	Not specified	512MB	Not specified	512MB
Storage	Not specified	Not specified	4GB	Not specified	4GB
Waterproof	Yes	Yes	Yes	Yes	Yes
Battery	130mAh	Not specified	300mAh	Not specified	300mAh
Dimensions	46x34x10.5mm	42x41x9mm	58.8x37.9x10mm	43x43x12.7mm	36.9x58.4x10mm
Weight	156g	123g	55g	52g	68g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/PPBXV7J	TINYURL.COM/P4X7AZM	TINYURL.COM/Q68FS5U	TINYURL.COM/NS9E8GK	TINYURL.COM/QXCZ8J3






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Best activity trackers	    				
	1	2	3	4	5
	Fitbit Charge HR	Fitbit Surge	Fitbit Charge	Fitbit One	Xiaomi Mi Band
Price	£119 inc VAT	£199 inc VAT	£99 inc VAT	£79 inc VAT	£29 inc VAT
Website	Fitbit.com/uk	Fitbit.com/uk	Fitbit.com/uk	Fitbit.com/uk	Mobilefun.co.uk
Launch date	Jan 15	Jan 15	Nov 14	Jan 14	Feb 15
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Compatibility	iOS, Android, Windows	iOS, Android, Windows	iOS, Android, Windows	iOS, Android	iOS, Android
Display	OLED	Touchscreen	OLED	OLED	No
Pedometer	Yes	Yes	Yes	Yes	Yes
Heart-rate monitor	Yes	Yes	No	No	No
Sleep tracking	Yes	Yes	Yes	Yes	Yes
Alarm	Yes	Yes	Yes	Yes	Yes
Third-party app syncing	Yes	Yes	Yes	Yes	No
Call notifications	Yes	Yes	Yes	No	Yes
Waterproof	Yes	Yes	Yes	No	Yes
Battery life	5+ days	5 days	7-10 days	10-14 days	30 days
Dimensions, weight	21.1mm, 26g	34mm, 51g	21.1mm, 24g	35.5x28x9.65mm, 8g	157-205mm, 13g
FULL REVIEW	TINYURL.COM/PCKV4SU	TINYURL.COM/O83DR47	TINYURL.COM/PFMQ9KH	TINYURL.COM/PT2TC6F	TINYURL.COM/QZ3YVCR






Best activity trackers	    				
	6	7	8	9	10
	Jawbone Up Move	Jawbone Up24	Misfit Flash	Withings Activité	Fitbit Flex
Price	£39 inc VAT	£99 inc VAT	£49 inc VAT	£320 inc VAT	£79 inc VAT
Website	Jawbone.com	Jawbone.com	Misfit.com	Withings.com	Fitbit.com/uk
Launch date	Nov 14	Mar 14	Sep 14	Oct 14	Oct 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Compatibility	iOS, Android	iOS, Android	iOS, Android	iOS, Android	iOS, Android
Display	No	No	No	Clock face	No
Pedometer	Yes	Yes	Yes	Yes	Yes
Heart-rate monitor	No	No	No	No	No
Sleep tracking	Yes	Yes	Yes	Yes	Yes
Alarm	No	Yes	Yes	Yes	Yes
Third-party app syncing	Yes	Yes	Yes	No	Yes
Call notifications	No	No	No	No	No
Waterproof	Splashproof	Splashproof	Yes	Yes	Yes
Battery life	Six months, non-rechargeable	7 days	Six months, non-rechargeable	Eight months, non-rechargeable	5 days
Dimensions, weight	27.6x27.6x9.8mm, 6.8g	S: 19g, M: 22g, L: 23g	28.5x8.0x28.5mm, 6g	36.3x195mm, 37g	S: 146-176x14mm, 29g
FULL REVIEW	TINYURL.COM/PFXQFNE	TINYURL.COM/ND8YMB8	TINYURL.COM/NPZZB9E	TINYURL.COM/OMBEHEG	TINYURL.COM/O7M08YW






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Best budget printers	    				
	1	2	3	4	5
	Samsung Xpress M2070W	Canon Pixma MG5550	Samsung Xpress M2022W	Canon Pixma MX535	Brother MFC-J870DW
Price	£100 inc VAT	£60 inc VAT	£68 inc VAT	£70 inc VAT	£120 inc VAT
Website	Samsung.com/uk	Canon.co.uk	Samsung.com/uk	Canon.co.uk	Brother.co.uk
Launch date	Mar 14	Apr 14	Aug 14	Jul 14	Jul 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology	Mono laser	Colour inkjet	Mono laser	Colour inkjet	Colour inkjet
Max print resolution	1200x1200	4800x1200dpi	1200x1200dpi	4800x1200dpi	6000x1200dpi
Actual print speed	B=17.1ppm	B=11.8ppm C=8.7ppm	B=18ppm	B=9.7ppm C=3.8ppm	B=18ppm C=11ppm
Scan/fax facilities	1200x1200 scans	1200x2400 scans	None	1200x2400 scans/fax	1200x2400 scans
Supported interfaces	USB 2.0, 802.11b/g/n, NFC	USB 2.0, 802.11b/g/n	USB 2.0, 802.11b/g/n	USB 2.0, 802.11b/g/n, AirPrint	USB 2.0, 802.11b/g/n, NFC
Cost per page	B=3.8p	B=2.4p C=4.8p	B=5p	B=2.7p C=4.8p	B=3.9p C=2.5p
Media card/auto duplex	xx	x✓	xx	x✓	✓✓
Input capacity	150 sheets	100 sheets	150 sheets	100 sheets + 30-sheet ADF	150 sheets + 20 ADF
Dimensions	406x360x253mm	455x369x148mm	332x215x178mm	458x385x200mm	410x374x180mm
Weight	7.4kg	6.3kg	4kg	8.5kg	9.5kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OYZKJKE	TINYURL.COM/LKWLJDE	TINYURL.COM/NFJHDOR	TINYURL.COM/N9LXV7	TINYURL.COM/M52V29R

Best printers	    				
	1	2	3	4	5
	Canon i-Sensys MF6180dw	Epson Ecotank L555	Brother HL-L9200CDWT	HP OfficeJet Pro X551dw	Kyocera Ecosys P6030cdn
Price	£320 inc VAT	£330 inc VAT	£548 inc VAT	£275 inc VAT	£546 inc VAT
Website	Canon.co.uk	Epson.co.uk	Brother.co.uk	Hp.com/uk	Kyoceradocumentsolutions.co.uk
Launch date	May 14	Jan 15	Aug 14	Aug 13	Jul 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Technology	Mono laser	Colour inkjet	Colour laser	Colour inkjet	Colour laser
Max print resolution	1200x600dpi	5760x1440dpi	2400x600dpi	2400x2400	9600x600dpi
Actual print speed	B=24ppm	B=8.5ppm C=4ppm	B=30ppm C=30ppm	B=42.9ppm C=15.8ppm	B=27ppm C=27ppm
Scan/fax facilities	600dpi scanner, 33.6Kb/s fax	1200dpi scanner, 33.6Kb/s fax	None	None	None
Supported interfaces	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0, ethernet, 802.11b/g/n	USB 2.0
Cost per page	B=1.5p	B=0.2p C=0.4p	B=1p C=5.9p	B=1p C=4.3p	B=1.2p C=1.7p
Media card/auto duplex	x✓	xx	x✓	x✓	x✓
Input capacity	250 + 50 sheet + 50 ADF	100 + 30 sheet	750 sheets + 50 sheet	500 + 50 sheet	500 sheets + 150 (2150 max)
Dimensions	390x473x431mm	474x377x226mm	410x495x445mm	517x399x414mm	345x518x480mm
Weight	19.1kg	6.2kg	28.3kg	17.1kg	29.5kg
Warranty	1 year	1 year	1 year	1 year	2 years
FULL REVIEW	TINYURL.COM/LE9WA5N	TINYURL.COM/N8NS5QL	TINYURL.COM/PT52MH6	TINYURL.COM/CZ05P65	TINYURL.COM/N4MCYLF

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Best wireless routers	    				
	1	2	3	4	5
	Apple AirPort Extreme	Netgear Nighthawk R7000	D-Link DIR 880L	TP-Link Archer C7	Asus RT-AC68U AC1900
Price	£169 inc VAT	£150 inc VAT	£108 inc VAT	£90 inc VAT	£160 inc VAT
Website	Apple.com/uk	Netgear.co.uk	Dlink.com	Tp-link.com	Uk.asus.com
Launch date	Jan 14	Sep 14	Sep 14	Jan 14	Jan 14
Overall rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
Standards supported	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac	802.11a/b/g/n/ac
Frequency modes	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)	2.4GHz/5GHz (concurrent)
Antennas	6x internal	3x external	3x external	3x external, 3x internal	3x external, 3x internal
Built-in modem	×	×	×	×	×
Manufacturer's rating	1300/450Mb/s	1300/600Mb/s	1300/600Mb/s	1300/450Mb/s	1300/600Mb/s
WPS	×	✓	✓	✓	✓
Ports	Gigabit WAN, 3x gigabit LAN, USB	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 1x USB 3.0, 1x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0	Gigabit WAN, 4x gigabit LAN, 2x USB 2.0
Average power use	8W	9W	10W	N/A	N/A
Max speed (11n/11ac)	171/572Mb/s	171/592Mb/s	171/625Mb/s	110/505Mb/s	98/610Mb/s
Dimensions, weight	98x168x98mm, 945g	285x186x45mm, 750g	247x190x47mm, 745g	32.5x243x160mm, 508g	160x83x220mm, 640g
Warranty	1 year	N/S	N/S	3 years	2 years
FULL REVIEW	TINYURL.COM/MFDLLSC	TINYURL.COM/Q2NR8Q	TINYURL.COM/OZ5G7KG	TINYURL.COM/KKJMPCE	TINYURL.COM/K4ZATKV






Best powerline adaptors	    				
	1	2	3	4	5
	Solwise SmartLink 1200AV2	TrendNet Powerline 500 AV2	Devolu dLan 1200+	TP-Link TL-WPA4230P	Devolu dLan 500AV Wireless+
Price	£43 inc VAT	£41 inc VAT	£119 inc VAT	£88 inc VAT	£129 inc VAT
Website	Solwise.com	Trendnet.com	Devolu.com/uk	Uk.tp-link.com	Devolu.com/uk
Launch date	Nov 14	Mar 14	Sep 14	Apr 14	Nov 12
Overall rating	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆	★★★★★☆☆
No of adaptors in kit	1 (2 required)	2	2	2	2
Max throughput	1200Mbps	600Mbps	1200Mbps	500Mbps	500Mbps
Near test result	410Mbps	146Mbps	357Mbps	100Mbps	96Mbps
Far test result	107Mbps	71Mbps	126Mbps	65Mbps	47Mbps
Ethernet ports	2x gigabit	1x gigabit	1x gigabit	3x fast	3x fast
Passthrough socket	Yes	No	Yes	Yes	Yes
Wireless hotspot	No	No	No	Yes	Yes
Encryption	128-bit	128-bit	128-bit	128-bit	128-bit
Dimensions	62x122x41mm	55x87x58mm	130x66x42mm	126x64x42mm	152x76x40mm
Weight	Not specified	90g	Not specified	Not specified	Not specified
Warranty	2 years	3 years	3 years	1 year	3 years
FULL REVIEW	TINYURL.COM/NZ4EJW8	TINYURL.COM/QYEPJQ7	TINYURL.COM/Q4EOO4M	TINYURL.COM/NKWAVP9	TINYURL.COM/KC2R6J2

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Best NAS drives	1	2	3	4	5
	Qnap TS-421	Synology DS115j	Qnap HS-210	Synology DS414j	Western Digital Red 6TB
Price	£320 inc VAT (diskless)	£83 inc VAT (diskless)	£190 inc VAT (diskless)	£270 inc VAT (diskless)	£220 inc VAT (diskless)
Website	Qnap.com	Synology.com	Qnap.com	Synology.com	Wdc.com
Launch date	Mar 14	Feb 15	Dec 14	Jan 15	Jan 15
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Drive bays	4	1	2	4	1
Processor	2GHz Marvell single-core	800MHz Marvell Armada 370	1.6GHz Marvell single-core	1.2GHz Mindspeed Concerto	N/A
Memory	1GB DDR3	256MB DDR3	512MB DDR3	512MB DDR3	64MB
Remote access	✓	✓	✓	✓	✓
eSATA	2x	✗	✗	1x	✗
USB port	2x USB 3.0, 2x USB 2.0	2x USB 2.0	2x USB 3.0, 2x USB 2.0	1x USB 3.0, 1x USB 2.0	n/a
Raid options	0/1/5/6/10/JBOD	None	0/1/JBOD	0/1/5/6/10/JBOD	n/a
Software	Backup Station	DSM 5.1	HD Station	DSM 5.0	NASware
Dimensions	177x180x235mm	71x161x224mm	302x220x41mm	184x168x230mm	147x102x26mm
Weight	3kg	700g	1.5kg	2.2kg	750g
Warranty	2 years	1 year	2 years	3 years	3 years
FULL REVIEW	TINYURL.COM/MCYWUB8	TINYURL.COM/MNEYVVK	TINYURL.COM/OEXRYNY	TINYURL.COM/M643BSG	TINYURL.COM/NBDGM5W

Best external hard drives	1	2	3	4	5
	Transcend StoreJet 25M3	Toshiba Canvio Basics	WD My Passport Ultra Metal	Seagate Seven mm	iStorage diskAshur Pro
Price	£70 inc VAT	£76 inc VAT	£90 inc VAT	£99 inc VAT	£269 inc VAT
Website	Uk.transcend-info.com	Toshiba.co.uk	Wdc.com/en	Seagate.com/gb/en	Istorage-uk.com
Launch date	Feb 15	Feb 15	Feb 15	Feb 15	Feb 15
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Capacity tested	2TB	2TB	2TB	500GB	1TB
Capacity range	500GB, 1TB, 2TB	500GB, 1TB, 2TB	1TB, 2TB	500GB	500GB, 1TB, 1.5TB, 2TB
Disk size	2.5in	2.5in	2.5in	2.5in	2.5in
Spin speed	5400rpm	5400rpm	N/A	5400rpm	5400rpm
Transfer speed	135MB/s	117MB/s	114MB/s	49MB/s	115MB/s
Encryption	256-bit AES	256-bit AES	256-bit AES	N/A	256bit AES-XTS
Other interfaces	USB 3.0	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Software	Transcend Elite	None	WD Drive Utilities	Seagate Dashboard	Security utilities
Dimensions	130x82x19mm	111x79x21mm	110x80x19mm	123x82x7mm	120x85x20mm
Weight	234g	207g	241g	178g	200g
Warranty	3 years	2 years	3 years	2 years	2 years
FULL REVIEW	TINYURL.COM/M72D3EP	TINYURL.COM/JWHHACB	TINYURL.COM/L2B7V3B	TINYURL.COM/O6KZFDM	TINYURL.COM/MZOBZ6J

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Best SSDs	    				
	1	2	3	4	5
	Crucial M550	OCZ Vector 150	Crucial M500	Samsung 840 EVO	Seagate 600 SSD
Price	£338 inc VAT	£125 inc VAT	£155 inc VAT	£320 inc VAT	£202 inc VAT
Website	Crucial.com/uk	Ocz.com	Crucial.com/uk	Samsung.com/uk	Seagate.com/gb
Launch date	May 14	May 14	Aug 13	Nov 13	May 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Capacity tested	1TB	240GB	480GB	750GB	480GB
Price per GB	34p	52p	32p	43p	43p
Memory cache	1GB LP DDR2	512MB	512MB DDR3	1GB LPDDR2	N/A
Controller	Marvell 88SS9189	Indilinx Barefoot 3 M00	Marvell 88SS9187	Samsung MEX (3-core ARM)	Link A Media Device
Encryption	AES 256-bit	AES 256-bit	AES 256-bit	AES 256-bit	None
Flash	Micron 20nm MLC NAND	Toshiba 19nm MLC	Micron 20nm MLC NAND	Samsung 19nm Toggle NAND	Toshiba 19nm MLC
Firmware updated via	Bootable CD	OCZ Toolbox, bootable	ISO boot disc	SSD Magician for Windows	Seagate Firmware, bootable
ATTO peak sequential	R: 563MB/s; W: 514MB/s	R: 557MB/s; W: 534MB/s	R: 539MB/s; W: 433MB/s	R: 554MB/s; W: 537MB/s	R: 555MB/s; W: 474MB/s
CDM peak IOPS	100 / 91.7	92.9 / 94.7	89.8k (read)	104K (read)	96.8 / 88.6
CDM 4kB rnd	30/99	25/97	N/A	N/A	28/78
Warranty	3 years	5 years or 91TB writes	3 years	5 years	3 years
FULL REVIEW	TINYURL.COM/MSWD98Z	TINYURL.COM/KBED2W6	TINYURL.COM/M2NCSMJ	TINYURL.COM/L5EDQOY	TINYURL.COM/N58RB8G

Best projectors	    				
	1	2	3	4	5
	ViewSonic PLED-W800	BenQ W1300	Optoma W316	InFocus IN126STa	NEC M352WS
Price	£512 inc VAT	£730 inc VAT	£458 inc VAT	£525 inc VAT	£778 inc VAT
Website	Viewsoniceurope.com/uk	Benq.co.uk	Optoma.co.uk	Infocus.com	Nec-display-solutions.com
Launch date	Feb 15	Jun 14	Jul 14	Sep 14	Jul 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Projection technology	DLP	DLP	DLP	DLP	DLP
Resolution (pixels)	1280x800	1920x1080	1280x800	1280x800	1280x800
Brightness, Contrast	800, 120,000:1	2000, 10,000:1	3400, 15,000:1	3300, 15,000:1	3500, 10,000:1
Image size	100in	300in	300in	300in	150in
Supported aspect ratios	16:10 native	16:9 native	16:10, 16:9, 4:3	16:10, 16:9, 4:3	16:10
Noise levels (dB)	34 (32 eco)	33 (30 eco)	29db	32db (30 eco)	33 (39 bright mode)
Connections	VGA, HDMI, USB	VGA, 2x HDMI, USB, 3D	VGA, HDMI, Mini-USB, 3D	2x VGA, HDMI, USB, ethernet	2x VGA, 2x HDMI, USB
Lamp/lamp life	90W/30000 hrs	240W/6000 hrs	190W/10000 hrs	278W/3500 hrs	278W/8000 hrs
Dimensions	175x52x138mm	330x257x128mm	315x223x102mm	292x220x108mm	368x268x97mm
Weight	0.83kg	3.4kg	2.5kg	3.7kg	3.6kg
Warranty	3 years	3 years	2 years	1 year	3 years
FULL REVIEW	TINYURL.COM/K83X8LA	TINYURL.COM/K4FA89Q	TINYURL.COM/OCWTHGW	TINYURL.COM/NHH3QPB	TINYURL.COM/Q6J2N6W

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Best budget graphics cards



1 MSI Radeon R9 270X

2 MSI Radeon R9 270 Gaming Ed

3 MSI R7 260X OC

4 XFX Radeon R7-265

5 Gigabyte GTX 750 Ti

	MSI Radeon R9 270X	MSI Radeon R9 270 Gaming Ed	MSI R7 260X OC	XFX Radeon R7-265	Gigabyte GTX 750 Ti
Price	£130 inc VAT	£125 inc VAT	£91 inc VAT	£110 inc VAT	£120 inc VAT
Website	Uk.msi.com	Uk.msi.com	Uk.msi.com	Sapphire.tech.com	Uk.gigabyte.com
Launch date	Dec 13	Jul 14	May 14	Sep 14	Aug 14
Overall rating	★★★★☆	★★★★★	★★★★☆	★★★★☆	★★★★☆
Graphics processor	AMD Radeon R9 270X	AMD Radeon R9 270	AMD Radeon R7 260X	AMD Radeon R7 265	nVidia GeForce GTX 750 Ti
Installed RAM	2GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5	2GB GDDR5
Memory interface	256-bit	256-bit	128-bit	128-bit	128-bit
Core clock/boost	1030MHz/1120MHz	900MHz/975MHz	1175MHz/none	900MHz/925MHz	1033MHz/1111MHz
Memory clock/Effective	1.4GHz/5.6GHz	1.4GHz/5.6GHz	1625MHz/6.5GHz	1.4GHz/5.6GHz	1.35GHz/5.4GHz
Stream processors	1280	1280	896	Varies	640
Texture units	80	80	56	64	40
Power connectors	2x 6-pin	1x 6-pin	1x 6-pin	1x 6-pin	N/A
DirectX	11	11.2	11.1	11	11.2
Digital interface	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DP	2x DVI, HDMI, Mini-DP	2x DVI, 1x HDMI, 1x DP	2x DVI, 2x HDMI
Warranty	2 years	3 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/OYA2DFJ	TINYURL.COM/MCE7353	TINYURL.COM/OZ6WUYT	TINYURL.COM/LV69BEM	TINYURL.COM/Q7K4ESV

Best graphics cards



1 Gigabyte GeForce GTX 770 2GB

2 Sapphire Radeon R9 280X






3 XFX Radeon R9 290X






4 MSI Radeon R9 270X

5 MSI Radeon R9 295 X2

	Gigabyte GeForce GTX 770 2GB	Sapphire Radeon R9 280X	XFX Radeon R9 290X	MSI Radeon R9 270X	MSI Radeon R9 295 X2
Price	£200 inc VAT	£200 inc VAT	£280 inc VAT	£150 inc VAT	£680 inc VAT
Website	Uk.gigabyte.com	Sapphire.tech.com	Xfxforce.com	Uk.msi.com	Uk.msi.com
Launch date	Aug 13	Mar 14	Apr 14	Dec 13	May 14
Overall rating	★★★★☆	★★★★★	★★★★★	★★★★☆	★★★★☆
Graphics processor	nVidia GeForce GTX 770	AMD Radeon R9 280X	AMD Radeon R9 290X	AMD Radeon R9 270X	AMD Radeon R9 295 X2
Installed RAM	2GB GDDR5	3GB GDDR5	4GB GDDR5	2GB GDDR5	8GB GDDR5
Memory interface	256-bit	384-bit	512-bit	256-bit	2x 512-bit
Core clock/boost	950MHz/1020MHz	950MHz/1070MHz	1GHz/1GHz	1030MHz/1120MHz	1018MHz/N/A
Memory clock/Effective	1.5GHz/6GHz	1.55GHz/6.2GHz	1.25GHz/5GHz	1.4GHz/5.6GHz	1.25GHz/5GHz
Stream processors	1536	2048	2816	1280	2x 2816
Texture units	128	128	176	80	2x 176
Power connectors	1x 6-pin, 1x 8-pin	2x 8-pin	8-pin, 6-pin	2x 6-pin	2x 8-pin
DirectX	11	11	11	11	11
Digital interface	2x DVI, HDMI, DisplayPort	DVI, HDMI, 2x Mini-DisplayPort	2x DVI, HDMI, DisplayPort	2x DVI, HDMI, DisplayPort	DVI, 4x Mini-DP
Warranty	3 years	2 years	3 years	2 years	3 years
FULL REVIEW	TINYURL.COM/OAG6277	TINYURL.COM/OWVAP37	TINYURL.COM/NPET8ER	TINYURL.COM/OYA2DFJ	TINYURL.COM/POTAOGZ





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Best budget flat-panel displays					
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3	4	5
	AOC i2369Vm	Philips 234E5QHAW	NEC MultiSync E243WMI	BenQ EW2740L	BenQ GL2450
Price	£130 inc VAT	£130 inc VAT	£194 inc VAT	£175 inc VAT	£108 inc VAT
Website	Aoc-europe.com/en	Philips.co.uk	Nec-display-solutions.com	Benq.co.uk	Benq.co.uk
Launch date	Jul 14	Jul 14	Jun 14	Aug 14	Jul 14
Overall rating	★★★★★	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	23in	23in	23.8in	27in	24in
Panel type	IPS matt	IPS matt	IPS matt	VA semi-matt	TN matt
Native resolution	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels	1920x1080 pixels
Pixel density	96ppi	96ppi	93ppi	82ppi	92ppi
Brightness	220cd/m ²	187cd/m ²	250cd/m ²	300cd/m ²	261cd/m ²
Static contrast ratio	630:1	210:1	650:1	280:1	610:1
Response time	6ms	5ms	6ms	4ms	5ms
Ports	HDMI, HDMI/MHL, DP, VGA	2x HDMI (QHAB) or 1x HDMI (QDAB), VGA	DP, DVI-D, VGA	2x HDMI, VGA	DVI-D, VGA
Dimensions	531x204x398mm	532x213x414mm	558x214x380-490mm	623x191x451mm	579x179x436mm
Weight	3.75kg	3.5kg	6.3kg	4.2kg	4.1kg
Warranty	3 years	2 years	3 years	2 years	2 years
FULL REVIEW	TINYURL.COM/OOEFYPR	TINYURL.COM/KLYLW4V	TINYURL.COM/KNCGVOU	TINYURL.COM/OO6EC5L	TINYURL.COM/OOUPFUE






Best flat-panel displays					
	1	2	3	4	5
	LG 34UM95	HP DreamColor Z27x	Dell UltraSharp 32 Ultra	BenQ PG2401PT	ViewSonic VP2772
Price	£760 inc VAT	£750 inc VAT	£1,455 inc VAT	£855 inc VAT	£540 inc VAT
Website	Lg.com/uk	hp.com/uk	Dell.co.uk	Benq.co.uk	Viewsoniceurope.com/uk
Launch date	Dec 14	Jan 15	Jun 14	Oct 14	Jun 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Screen size	34in 21:9	27in	31.5in	24.1in	27in
Panel type	IPS matt	AH-IPS	IGZO	IPS	AH-IPS
Native resolution	3440x1440	2560x1440 pixels	3840x2160 pixels	1920x1200 pixels	2560x1440 pixels
Pixel density	110ppi	109ppi	140ppi	94ppi	109ppi
Brightness	320cd/m ²	250cd/m ²	350cd/m ²	317cd/m ²	350cd/m ²
Static contrast ratio	1000:1	800:1	550:1	540:1	560:1
Response time	5ms	7ms	8ms	5ms	6ms
Ports	HDMI, DP, Thunderbolt, USB 3.0	HDMI, DP, USB 3.0, USB 2.0	HDMI, DP, Mini-DP, 4x USB 3.0	DVI, DP, HDMI, VGA, 3x USB 3.0	HDMI, DVI, Mini-DP, 4x USB 3.0
Dimensions	830x83x380mm	641x655x379mm	750x214x483-572mm	543x254x555mm	643x348x470mm
Weight	6.7kg	8.8kg	9.2kg	7kg	8.5kg
Warranty	2 years	3 years	3 years	1 year	3 years
FULL REVIEW	TINYURL.COM/QYKH6UM	TINYURL.COM/NKUF9EN	TINYURL.COM/O4CTO3S	TINYURL.COM/PMV5L5V	TINYURL.COM/LLQRWTX

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Best e-book readers






					
	1	2	3	4	5
	Amazon Kindle Voyage	Amazon Kindle (7th gen)	Amazon Kindle Paperwhite	Nook GlowLight	Kobo Aura H2O
Price	£169 inc VAT	£59 inc VAT	£109 inc VAT	£89 inc VAT	£139 inc VAT
Website	Amazon.co.uk	Amazon.co.uk	Amazon.co.uk	Nook.com/gb	Kobo.com
Launch date	Oct 14	Sep 14	Sep 13	Oct 13	Sep 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Screen size	6in touchscreen	6in touchscreen	6in touchscreen	6in touchscreen	6.8in touchscreen
Screen technology	E Ink	E Ink	E Ink	E Ink	E Ink
Screen resolution	1440x1080	600x800	768x1024	758x1024	1430x1080
Built-in light	Yes	No	Yes	Yes	Yes
Storage	4GB	4GB	2GB	4GB	4GB, microSD up to 32GB
Book store	Amazon Kindle	Amazon Kindle	Amazon Kindle	Nook	Kobo
Cellular connectivity	Optional extra	No	Optional extra	No	No
Battery life	Six weeks	Four weeks	Eight weeks	Eight weeks	Two months
Dimensions	162x115x7.6mm	169x119x10.2mm	117x169x9.1mm	127x166x10.7mm	179x129x9.7mm
Weight	180g	191g	206g	175g	233g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/NXAAU3Q	TINYURL.COM/NSFORJE	TINYURL.COM/PREZPRK	TINYURL.COM/OZ5WMPO	TINYURL.COM/MJVR4M9

Best media streamers






					
	1	2	3	4	5
	Roku Streaming Stick	Roku 3	Google Chromecast	Apple TV	Amazon Fire TV
Price	£49 inc VAT	£99 inc VAT	£30 inc VAT	£59 inc VAT	£79 inc VAT
Website	Roku.com	Roku.com	Play.google.com	Apple.com/uk	Amazon.co.uk
Launch date	Mar 14	Mar 13	Mar 14	Mar 12	Oct 14
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Type	Dongle	Set-top box	Dongle	Set-top box	Set-top box
Ports	HDMI, Micro-USB	HDMI, USB, ethernet	HDMI, Micro-USB	HDMI, ethernet, Micro-USB	HDMI, USB, ethernet
Processor	600MHz single-core	900MHz single-core	Single-core	Apple A5 single-core	1.7GHz Qualcomm quad-core
RAM	512MB	512MB	512MB	512MB	2GB
Graphics	Not specified	Not specified	Not specified	Not specified	Adreno 320
Storage	None	512MB plus microSD slot	None	8GB (not user-accessible)	8GB
Voice search	No	Yes	No	No	Yes
Remote control	Yes	Yes	No	Yes	Yes
Dimensions	78.7x27.9x12.7mm	89x89x25mm	72x35x12mm	98x98x23mm	115x115x17.5mm
Weight	18g	170g	34g	270g	281g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/OAP9QF9	TINYURL.COM/PT7MGUL	TINYURL.COM/QBGTCS2	TINYURL.COM/OLCJRC3	TINYURL.COM/P4RE7WP






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Best games consoles					
	1	2	3	4	5
	Sony PlayStation 4	Microsoft Xbox One	Nintendo Wii U Premium	Sony PlayStation 3 Super Slim	Microsoft Xbox 360
Price	£349 inc VAT	£349 inc VAT	£249 inc VAT	£249 inc VAT	£199 inc VAT
Website	Playstation.com	Xbox.com	Nintendo.co.uk	Playstation .com	Xbox.com
Launch date	Nov 13	Nov 13	Nov 12	Sep 12	Dec 05
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★
Processor	Octa-core AMD x86	1.75GHz octa-core AMD x86	IBM Power multicore CPU	IBM CPU	IBM Xenon CPU
Graphics	1.84TFlops AMD Radeon GPU	1.31TFlops AMD Radeon GPU	AMD Radeon GPU	256MB nVidia RSX	512MB ATI Xenos
RAM	8GB GDDR5	8GB DDR3	Not specified	Not specified	512MB GDDR3
Storage	500GB	500GB	32GB, plus SD card support	500GB	500GB
Optical drive	Blu-ray, DVD, game discs	Blu-ray, DVD, game discs	Wii U, Wii discs only	Blu-ray, DVD, game discs	DVD, game discs
Ports	2x USB 3.0, AUX, HDMI	USB 3.0, HDMI	4x USB 2.0, HDMI	2x USB 2.0, HDMI	5x USB, HDMI
Connectivity	Ethernet, 802.11b/g/n, Bluetooth	Ethernet, 802.11b/g/n	802.11b/g/n	Ethernet, 802.11b/g/n, Bluetooth	Ethernet, 802.11b/g/n
Other	1 controller	1 controller, 4K, Kinect option	1 controller	1 controller	1 controller
Dimensions	275x53x305mm	333x274x79mm	46x269x171mm	290x230x60mm	269x75x264mm
Weight	2.8kg	3.2kg	1.6kg	2.1kg	2.9kg
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/NBFLQK2	TINYURL.COM/M6J4KHS	TINYURL.COM/6J49LHL	TINYURL.COM/QDJP560	TINYURL.COM/PFP9CCK






Best budget portable speakers					
	1	2	3	4	5
	Lumsing B9	i-box Twist	Lava BrightSounds	iClever IC-BTS02	Edifier Sound To Go Plus
Price	£23 inc VAT	£41 inc VAT	£39 inc VAT	£23 inc VAT	£37 inc VAT
Website	Lumsing.com	Iboxstyle.com	Lavaaccessories.co.uk	Hisgadget.com	Edifier-international.com
Launch date	Aug 14	Nov 12	Dec 14	Nov 14	Apr 12
Overall rating	★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★☆
Speaker(s)	2x 3W	2x 3W	1x 5W	1x 5W	2x 1.5W
Bluetooth	Bluetooth 3.0 + EDR	Bluetooth 2.1	Not specified	Bluetooth 4.0	Not specified
Handsfree calls	Yes	Yes	Yes	Yes	No
NFC	Yes	No	No	No	No
Frequency response	20Hz to 20kHz	Not specified	Not specified	90Hz to 18kHz	270Hz to 17kHz
Impedance	4 ohms	Not specified	Not specified	Not specified	Not specified
Extra features	MicroSD slot, lanyard	None	IPX4 splashproof, LED lamp	None	Carry case
Claimed battery life	25 hours	5 hours	8 hours	8-12 hours	10 hours
Dimensions	177x50x70mm	246x59x56mm	190x95x103mm	64.5x64.5x70.1mm	261x36x44mm
Weight	300g	380g	821g	261g	370g
Warranty	1 year	5 years	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/P623MK8	TINYURL.COM/LET9RDF	TINYURL.COM/KOM2ZT3	TINYURL.COM/Q2YT6NV	TINYURL.COM/OW7TF38




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Best budget headphones	    				
	1 PC ADVISOR RECOMMENDED	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	RHA MA450i	Sennheiser HD 429	Rock Jaw Alpha Genus	AKG K77	Vibe Slick Zip V3
Price	£39 inc VAT	£45 inc VAT	£41 inc VAT	£25 inc VAT	£12 inc VAT
Website	Rha-audio.com/uk	En-uk.sennheiser.com	Rockjawaudio.com	Uk.akg.com	Vibeaudio.co.uk
Launch date	Nov 14	Jan 11	Jun 14	May 08	Sep 13
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Type	In-ear	Circumaural over-ear	In-ear	Circumaural over-ear	In-ear
Frequency response	16Hz to 22kHz	18Hz to 22kHz	20Hz to 20kHz	18Hz to 20.5kHz	20Hz to 20kHz
Nominal impedance	16 ohms	32 ohms	16 ohms	32 ohms	16 ohms
Sensitivity	103dB	110dB	108dB	112dB	93dB
In-line remote	Yes (3 button)	No	No	No	Yes (1 button)
Mic	Yes	No	No	No	Yes
Extra grommets	Yes	N/A	Yes, and filters	N/A	Yes
Carry case	Yes	No	Yes	No	No
Cable length	1.5m (braided)	3m	1.2m (twisted)	2.5m	1.2m
Weight	14g	218g	11g	190g	21g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/P7W7RVL	TINYURL.COM/ND8TD8O	TINYURL.COM/NNYUFBF	TINYURL.COM/PA8FOX4	TINYURL.COM/QJULK9P

Best headphones	    				
	1 PC ADVISOR BEST BUY	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5 PC ADVISOR RECOMMENDED
	Denon AH-D600	Bose QC20	Denon AH-W150	Bowers & Wilkins P3	RHA MA450i
Price	£229 inc VAT	£259 inc VAT	£59 inc VAT	£169 inc VAT	£39 inc VAT
Website	Denon.co.uk	Bose.co.uk	Denon.co.uk	Bowers-wilkins.co.uk	Rha-audio.com/uk
Launch date	Aug 2012	Jun 13	Aug 12	Jun 12	Nov 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Type	Circumaural over-ear	In-ear	Over-ear wireless buds	On-ear, foldable	In-ear
Frequency response	8Hz to 25kHz	20-21kHz	5Hz to 25kHz	10Hz to 20kHz	16Hz to 22kHz
Nominal impedance	37 ohms	32 ohms	16 ohms	34 ohms	16 ohms
Sensitivity	120dB	105dB	102dB	111dB	103dB
In-line remote	Yes	Yes	Yes	Yes	Yes (3 button)
Mic	No	Yes	Yes	Yes	Yes
Extra grommets	N/A	Yes	Yes	N/A	Yes
Carry case	Yes	Yes	Yes	Yes	Yes
Cable length	3m	1.3m	N/A	1.2m	1.5m (braided)
Weight	250g	44g	23g	132g	14g
Warranty	1 year	1 year	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/NBCFJW6	TINYURL.COM/OEAGFOF	TINYURL.COM/O2CJV3R	TINYURL.COM/PZ07PON	TINYURL.COM/P7W7RVL

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Best power banks					
	1 PC ADVISOR GOLD	2 PC ADVISOR RECOMMENDED	3 PC ADVISOR RECOMMENDED	4 PC ADVISOR RECOMMENDED	5
	Zendure A2	Anker Astro Mini	Intocircuit Power Castle	Intocircuit PowerMini	Lumsing 10400mAh
Price	£33 inc VAT	£13 inc VAT	£22 inc VAT	£10 inc VAT	£17 inc VAT
Website	Zendure.com	lanker.com	Hisgadget.com	Hisgadget.com	Lumsing.com
Launch date	May 14	Apr 13	Mar 13	Jul 14	Apr 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Capacity	6000mAh	3200mAh	11200mAh	3000mAh	10400mAh
Input	1x 7.5W Micro-USB	1x 4W Micro-USB	1x 5W Micro-USB	1x 5W Micro-USB	1x 7.5W Micro-USB
Outputs	1x 10.5W USB	1x 5W USB	1x 10.5W USB, 1x 5W USB	1x 5W USB	1x 10.5W USB, 1x 5W USB
Auto-on/-off	Yes	No	Auto-on	No	No
Passthrough charging	Yes	No	Yes	No	No
Status indicator	4 LEDs	No	LCD screen	3 LEDs	4 LEDs
LED flashlight	No	No	Yes	Yes	No
Carry case	Yes	Yes	Yes	Yes	Yes
Dimensions	93x48x23mm	92x23x23mm	110x71x22mm	110x20x20mm	138x59x20mm
Weight	137g	80g	280g	118g	354g
Warranty	1 year	18 months	1 year	1 year	1 year
FULL REVIEW	TINYURL.COM/NGCNO5F	TINYURL.COM/PZHUHJO	TINYURL.COM/P5M9NKE	TINYURL.COM/KWONE54	TINYURL.COM/Q9DYG5G

Best desktop chargers					
	1 PC ADVISOR RECOMMENDED	2	3	4	5
	iClever USB Travel Charger	Zendure Turbo Charger	Olixar Smart IC Charger	Inateck USB Charger	Lumsing 5-Port Charger
Price	£20 inc VAT	£25 inc VAT	£34 inc VAT	£15 inc VAT	£8 inc VAT
Website	Hisgadget.com	Zendure.com	Mobilefun.co.uk	Inateck.com	Lumsing.com
Launch date	Oct 14	May 14	Feb 15	Feb 14	Apr 14
Overall rating	★★★★★	★★★★★	★★★★★	★★★★★	★★★★★
Max output	50W	40W	50W	35W	30W
Outputs:					
USB 1	12W USB	12W USB	12.5W USB	10.5W USB	10W USB
USB 2	12W USB	12W USB	12.5W USB	10.5W USB	10W USB
USB 3	12W USB	12W USB	12.5W USB	5W USB	10W USB
USB 4	12W USB	12W USB	12.5W USB	5W USB	5W USB
USB 5	12W USB	12W USB	12.5W USB	5W USB	5W USB
USB 6	12W USB	N/A	12.5W USB	N/A	N/A
Colours available	Black	Black, white	White	Black	Black
Dimensions	100x69x27mm	97x60x27mm	100x69x26mm	100x55x20mm	136x68x30mm
Weight	180g	166g	189g	340g	422g
Warranty	1 year	1 year	2 years	1 year	1 year
FULL REVIEW	TINYURL.COM/MPA4DWC	TINYURL.COM/NKYNJ7P	TINYURL.COM/OCZXK93	TINYURL.COM/KBXUHF	TINYURL.COM/LK220GY

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Samsung: King of Android

It takes a lot to drag me away from sitting in front of the TV, watching sport on a Sunday afternoon. And, I'm guessing, that is the case for many people, although the more interesting among you may substitute, 'going for a bike ride', 'taking a stroll' or 'washing the car' for my own football-, rugby- and cricket-related gogglebox tendencies.

This particular Sunday was different. The sabbath found me and millions more tuning into live webcasts of smartphone launches. I was watching because it is my job to do so, but the numbers of viewers to the live streams and live blogs on the *PC Advisor* website tell me just how popular were the HTC One M9 and Samsung Galaxy S6 launches. Both trended worldwide on Twitter, which is more than can be said for West Ham vs Crystal Palace.

This is not a new phenomenon. Starting with Apple's 2007 iPhone launch, and spreading outside the Apple world with the Galaxy S III unveiling, smartphone events have become box office. But not all smartphones are made equal. And nor is the mindshare each commands.

The iPhone remains top of the shop. Each new Apple phone melts web servers the world over. Face facts, Android fans - people care more about iPhones than they do any Android handset.

But Samsung's Galaxy phones are a close-run second. The Galaxy S2 was the first Android we saw that really gripped the imaginations of a large audience of smartphone fans, and the Galaxy S III launch was the first time that we saw huge traffic for a non-Apple phone launch.

It continues. Despite the plaudits showered upon the new HTC One M9 (see page 34), it was Samsung's event that attracted a huge audience. And it continued throughout MWC - two of the top five stories on *PCAdvisor.co.uk* were about the Galaxy S6. And this is a website with more than one million pieces of content, on which hundreds of stories are published every day.

We knew this would be the case, of course. When, in advance of MWC, we asked readers of *PC Advisor*: "What product are you most looking forward to hearing about at MWC 2015?" The Galaxy S6 Edge was top with 19 percent of the votes, and the Galaxy S6 second with 13 percent. In a list of 12 products, a third of respondents (more than 1,000 people) chose products with 'Samsung Galaxy S6' in the name. Of the other contenders only the HTC One M9 with 17 percent of the vote, and the nonexistent Sony Xperia Z4 (13 percent) were chosen by more than 10 percent of voters.

Fast forward beyond the launches and the latest results stand out even more. The current *PC Advisor* poll is still in field, and has 3,012 respondents. But of those people 44 percent are most interested in either the Galaxy S6 or the Galaxy S6 Edge. Nothing else has more than the HTC One M9's 17 percent.

This doesn't say anything fundamental about how good, bad or indifferent are these products. But the fact remains that outside of the cult of Apple, Samsung remains the big beast about which people care the most. And given Apple's eminently sensible absence from MWC, this means that Samsung rules MWC with ease. ☒

“Outside of the cult of Apple, Samsung remains the big beast about which people care the most”



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